American Artisan

THE WARM AIR HEATING AND SHEET METAL JOURNAL

FOUNDED 1880

Inland Sheets were used in the sheet-metal work in the World's largest building . . . the Chicago Merchandise Mart. Sheet-metal work done by the R. B. Hayward Co.

A Reputation, like a Building, must have a Good Foundation

OUT of the experience, skill and labor you sell comes your reputation. But the foundation of that reputation is the raw material with which you work. If the material you use on any job is poorly chosen for the purpose in hand, if it fails to last as long as the customer thinks it should, your work, no matter how good, comes to naught . . . your reputation is impaired.

To have a solid foundation for their workmanship, more and more sheet-metal contractors are standardizing on Inland Sheets. Inland Sheets are available for every purpose. They are made particularly for that purpose. Their long and satisfactory service is assured by the skill, the knowledge, the broad experience which Inland brings to the manufacture of steel.

Inland will furnish you with a dependable foundation for your business. Consult with Inland freely—as to your needs.

INLAND STEEL COMPANY

ABLE SERVANT OF THE CENTRAL WEST

Sheets
Bars
Plates
Structurals
Bands

Rails
Track Accessories
Rivets
Billets

38 SOUTH DEARBORN STREET, CHICAGO

SEPTEMBER 27, 1930

THE PLUMBER, STEAM FITTER, REALTOR, PAINTER, DECORATOR AND ELECTRICAL CONTRACTOR ARE ALL GETTING EXTRA BUSINESS BY PUSHING THE IDEA OF

HOME MODERNIZING

Modernizing the HEATING SYSTEM is of Major Importance to Completely Modernize the Home

▼

YOU KNOW

THAT MODERN WARM AIR HEATING IS THE UP-TO-THE MINUTE METHOD OF HEATING —TELL AND SHOW YOUR PROSPECTS WHY AND MAKE EXTRA SALES

YOU have to be up on your toes these days to not just get business but to ***stay*** in business. With all the advantages of ***modern*** warm air heating you have a sales story that will swing any prospect to warm air heating—***and at a good price.***

Sell warm air heating on its merits as the most desirable, practical, dependable and healthful system of heating. Talk furnace fans, blowers, automatic humidity and heat regulation and cooling for summer.

Radiator competition and price jobs can not dent your sales arguments if you sell ***modern*** warm air heating. Obviously you must back up such a sales presentation with high quality merchandise. The Success line of high grade leak proof constructed heaters are first quality in scientific design, material and workmanship. There is a superior Success Heater for every size installation—and our "Big Success Idea" is the most successful, practical sales plan ever ***put to use*** by progressive dealers. Write today for full details.

SUCCESS HEATER MFG. CO.
DES MOINES, IOWA

SUCCESS HEATERS

KRUGER

This mark
is Revere's guarantee to you
of quality, responsibility and service

Revere
COPPER
&
BRASS
Products

Revere Copper *and* Brass Incorporated

DIVISIONS:

Baltimore *Copper Mills, Baltimore, Md.*
Higgins *Brass & Manufacturing Co., Detroit, Mich.*
Taunton-New Bedford *Copper Co., Taunton, Mass.*
Dallas *Brass & Copper Co., Chicago, Ill.*
Michigan *Copper & Brass Co., Detroit, Mich.*
Rome *Brass & Copper Co., Rome, N. Y.*

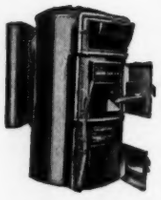
GENERAL OFFICES: ROME, N. Y.

Published Every Other Week by Porter, Spofford, Langtry Corp., 139 North Clark Street, Chicago, Illinois. AMERICAN ARTISAN—the Warm Air Heating and Sheet Metal Journal—entered as second class matter, January 29, 1930, at the Post Office at Chicago, Illinois, under the act of March 3, 1879. Formerly entered on June 25, 1887, as American Artisan and Hardware Record.

INDEX PAGES—20 and 56 **[VOL. 99, NO. 20—$2.00 PER YEAR]** **BUYERS' DIRECTORY—52 and 54**

OUT-SHINES THEM ALL

THE Western leads the field of modern Quality furnaces, in construction detail, in cold-weather comfort, in reputation. Most modern furnaces have some brilliant characteristics of sales value. The Western—from practical, progressive Western Steel Products Company—out-shines them all in simplicity of design, in heating capacity, in time-surviving service.



Write for information.

WESTERN STEEL PRODUCTS CO.

130 Commonwealth Ave.—Duluth, Minn.

Group One

Pittsburgh, Pa. — *Pittsburgh Furnace Parts Company*

Ravenna, Ohio — *Ravenna Furnace Company*

Cincinnati, Ohio — *Niehaus Furnace Repair Company*

Atlanta, Ga.—*Moncrief Furnace Company*

Chicago, Ill.—*Western Steel Products Company*

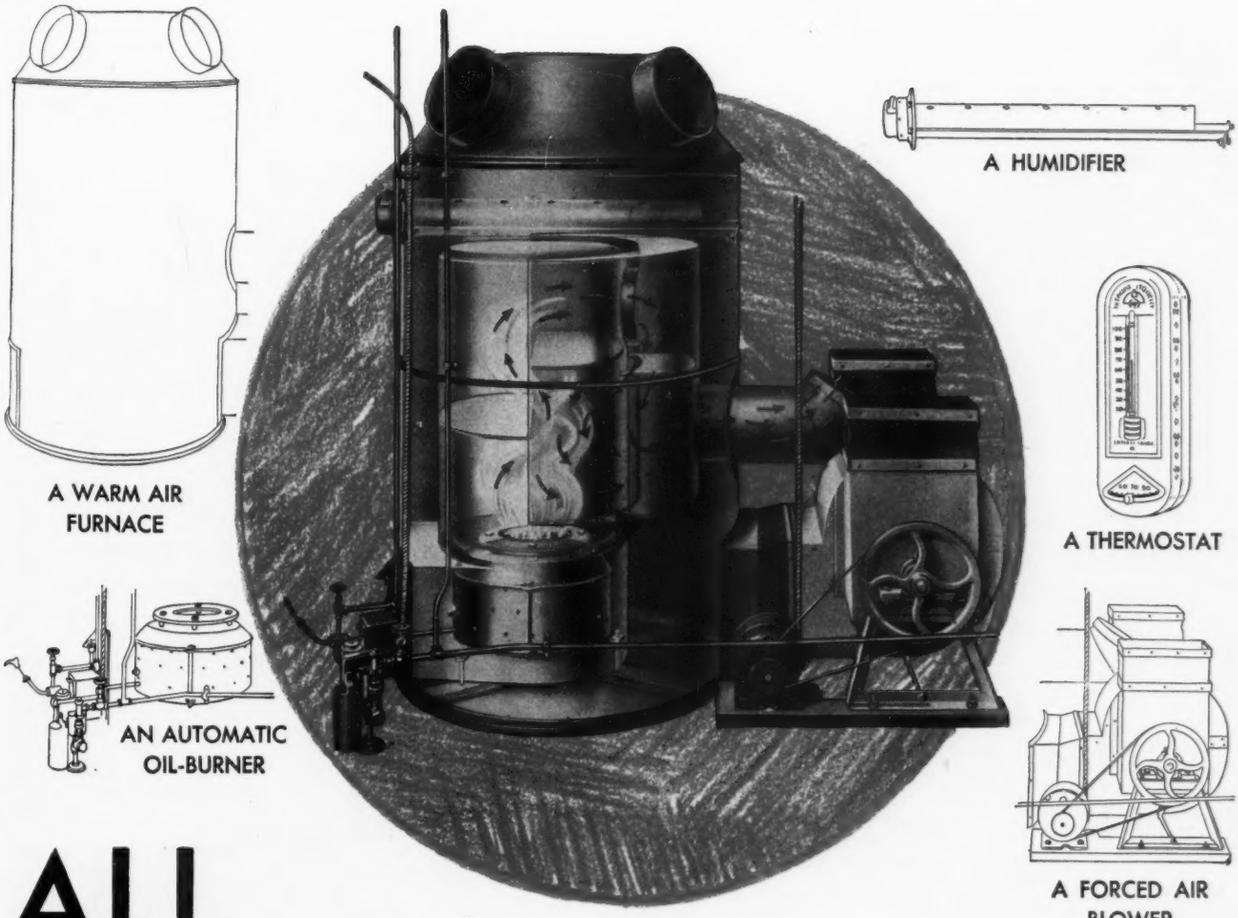
Group Two

St. Louis, Mo.—*MacRoy Supply Co.*
Kansas City, Mo.—*Kansas City Furnace Co.*
Duluth, Minnesota—*Marshall-Wells Co.*
Omaha, Nebraska—*A. Y. McDonald Mfg. Co.*
Lincoln, Nebraska—*A. Y. McDonald Mfg. Co.*
Sioux City, Iowa—*A. Y. McDonald Mfg. Co.*
Minneapolis, Minn.—*A. Y. McDonald Mfg. Co.*
Fort Dodge, Iowa—*Leighton Supply Co.*
Fargo, N. D.—*Fargo Cornice & Ornament Co.*

Group Three

Seattle, Wash.—*McPherson Furnace Co.*
San Francisco, Cal.—*Pacific Sheet Metal & Furnace Co.*
Winnipeg, Man. — *Marshall-Wells Co.*
Saskatoon, Sask. — *Wood-Vallance Co., Ltd.*
Regina, Sask. — *Wood-Vallance Co., Ltd.*
Edmonton, Albta.—*Marshall-Wells Alberta Co., Ltd.*

• • • • • IN ONE UNIT • • • • •



ALL
for the price of a good oil-burner alone

Here is the most sensational development Sheet Metal Men have seen in years. It is hailed as the marvel of the heating industry—the Piatt Automatic Oil-Burning Furnace. The heating element is the famous Piatt used in homes, schools, apartment houses. It is safe, certain and employs the simplest kind of construction.

The furnace is designed for the oil-burner, the oil-burner for the furnace. No part of the construction is an accessory part built *on*, but built *in* to one scientifically-designed, well-made unit. The burner itself is the famous Piatt, noiseless in operation, thoroughly dependable, safe and fully automatic with no springs, weights or complications.

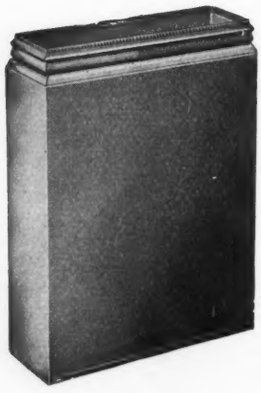
With the blower arrangement, small conductor pipes may be used with the resulting saving of space and headroom. The furnace need not occupy a central position in the basement but may be set out of the way allowing extra basement space. It is being hailed on all sides as a revolutionary accomplishment in warm air heating. Send today for complete literature and technical data.

MOTOR WHEEL CORPORATION, Heater Division, LANSING, MICHIGAN

PIATT
DOMESTIC UTILITIES

Motor Wheel Corp., Dept. 250, Heater Division, LANSING, MICH.
Send me at once, full information and profit-building plan on the Piatt Heater. I am not obligating myself but will study the details carefully.

Name _____
(Please print or typewrite)
Street _____
City _____ *State* _____
My Business _____



Let HANDY PIPE Help You to Build the Remaining Months of 1930 Into a Healthy and Profitable Business Season. You Will Find "The Handy Pipe People a Mighty Fine Bunch to Tie to" for "Everything Needed in the Installation of Warm Air Furnaces"

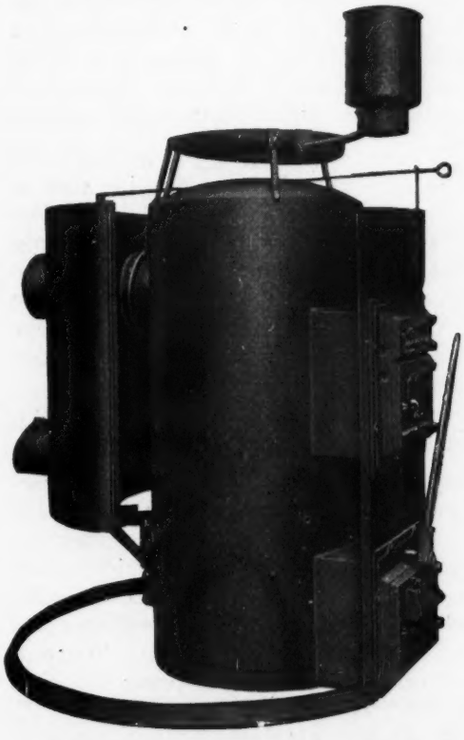
F. MEYER & BRO. CO., PEORIA, ILL.

Only Waterbury Dealers Can Say---

"This Furnace Is GUARANTEED Permanently Gas-Tight"

The most profitable heating system for you to sell is the one that will give your customers the greatest comfort and satisfaction. Positive gas-tight construction is absolutely necessary to meet these two major requirements.

The Waterbury is built of SEAMLESS WELDED STEEL to insure it being both permanently gas-tight and exceptionally durable. Cement may crack, rivets and calking may loosen, but Waterbury welded seamless construction never opens—never leaks. The Waterbury remains gas-tight through many years of added service.



The Waterbury Franchise Gives You Bigger Profits

Waterbury dealers don't have to be afraid of cut-price competition. You make a good profit on every sale. Your customers will pay your price for a heating system well worth the money, because you can prove to them that it is the cheapest for them in the long run.

The Waterbury Franchise includes a Merchandising Sales Plan that makes more and easier sales for you. It will help you put your heating business on a real money-making basis. Write for complete details at once.

Mail This Coupon NOW!

The Waterman - Waterbury Co.
1122 Jackson St. N. E. Minneapolis, Minnesota
Complete Stock Carried in
PHILADELPHIA DENVER TACOMA
KANSAS CITY CHICAGO PITTSBURGH
SAN FRANCISCO

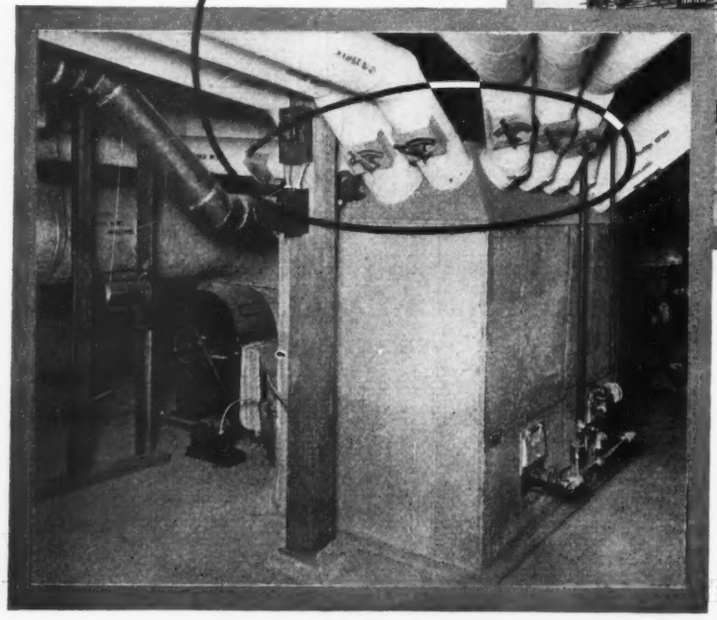
The Waterman-Waterbury Co.
1122 Jackson St. N. E.,
Minneapolis, Minnesota

Please send me complete information about the Waterbury Franchise and the Merchandising Sales Plan.

NAME .....
ADDRESS .....
CITY ..... STATE .....

Mention AMERICAN ARTISAN in your reply—Thank you!

ANOTHER TYPICAL INSTALLATION OF HYRO UNXLD DAMPER QUADRANTS



WARM-AIR HEATING is very popular in Portland, Oregon, thanks largely to the efforts of the Portland Gas & Coke Company, who have installed more than 4,000 furnaces there, a large number of them in residences. One such representative installation is in the exceptionally fine home of Mr. George Black, 961 Talbot Road, shown above. This is a forced circulation system with Minneapolis-Honeywell control.

It is only natural that a fine job such as this should be equipped with the best of everything, even in damper quadrants. And in damper quadrants the most economical and safest is the HYRO UNXLD. You can plainly see a whole flock of these dependable safeguards in the illustration above.

HYRO UNXLD Damper Quadrants fulfill their duty 100%. They are sturdy and easy to install on both flat and curved surfaces. They hold the damper rigidly and always show its true position. They are easy to regulate. On the biggest job as well as on the smallest, on residence or public building, HYRO UNXLD will give you and your customers satisfaction. The coupon below will bring you prices and sizes (to fit every need). Send it today!

This is the HYRO UNXLD Damper Quadrant, Patented December 23, 1919, No. 1,326,096

HYRO MFG. CO., Inc.
202 Varick Street, New York, N. Y.

Gentlemen:

Please send me complete information about Hyro Damper Quadrants.

Name.....

Address.....

City.....State.....

HYRO MANUFACTURING CO., INC.
202 VARICK STREET
NEW YORK N. Y.

Say you saw it in AMERICAN ARTISAN—Thank you!

TO ALERT, LIVE-WIRE FURNACE DEALERS

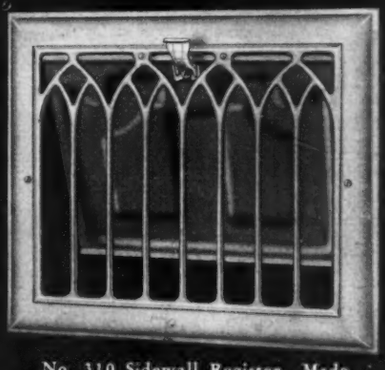
NO doubt there are still a lot of warm air heating jobs sold in which the registers are considered simply as necessary adjuncts, and little or no thought given to efficiency, design or air capacity on the part of the buyer. But a host of alert, live-wire dealers are standardizing on H & C Registers, and using their outstanding superiority as an added means of building up favorable opinion for their heating proposals. And in many cases, they tell us its a ***highly important*** factor in gaining the job.

The popularity of our new No. 110 series is growing by leaps and bounds due to the fact that in addition to the appeal of its mechanical excellence, its exceptionally attractive design creates a desire for possession in the minds of most prospects that is difficult to offset.

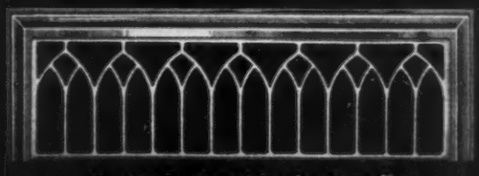
Better investigate this series at once if you haven't already done so. It's a big help in making furnace sales—

See the H & C line at your jobber or write direct for catalog

No. 110 Series, two-piece register. Size 8 x 12, has full capacity for 10" pipe.



No. 310 Sidewall Register. Made in horizontal type only, sizes 8 x 10 and 8 x 12.



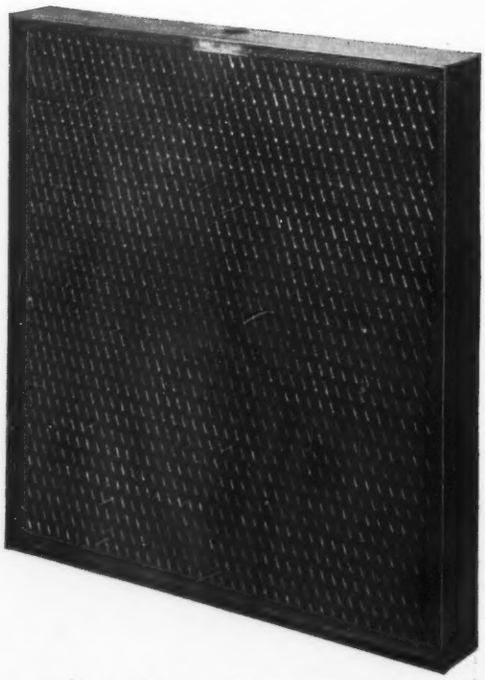
No. 651 Baseboard Intake. A small intake of exceptional efficiency made in sizes 4 x 14 and 4 x 30.

WROUGHT STEEL H&C WARM AIR REGISTERS

Made by HART & COOLEY Mfg. Co.

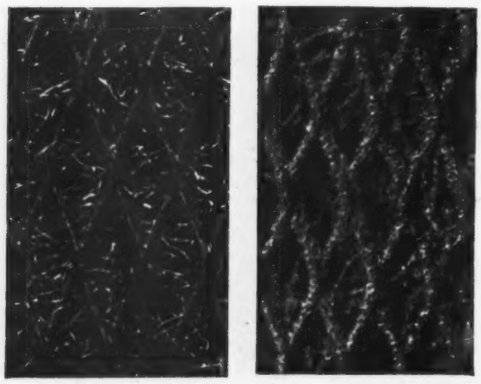
CHICAGO—61 W. Kinzie St. NEW BRITAIN, CONN.—Corbin Ave.
Philadelphia, 1600 Arch Street—New York, 101 Park Avenue—Boston, 75 Portland Street—Nashua, New Hampshire
Factories at Holland, Mich.—New Britain, Conn.—Nashua, N. H.
ALSO A COMPLETE LINE OF FURNACE REGULATORS, CHAIN, PULLEYS, DAMPERS, ETC.

. . Now Sell Clean Heat



The Reed Furnace Filter strains the dirt and germ-laden dust from the air so that the furnace delivers **clean** *heat.*

Reed Furnace Filters may be had to fit any warm air furnace.



Unretouched photographs showing front of a clean **Reed Filter** *and the accumulation of dust and dirt after a few weeks of service.*

Reed Furnace Filters strain the dirt out of the air . . . Ceilings, walls, woodwork and draperies now stay clean . . . . . .

EVERY sunbeam that falls across the path of any furnace register is a demonstration of the fact that there *is* something in the air. It may be dust, dirt, or lint, in indescribably fine particles, but it shouldn't be there if you want to breathe CLEAN air. And it *won't* be there if the air is *filtered.*

Filtered air is the latest and greatest luxury. It not only adds to health and comfort, cutting down the number of head-colds and numerous other irritations of the nasal passages, but filtered air also has an economical aspect which recommends it instantly to every housewife. Filtered air does not make streaks on the walls; filtered air does not dirty the woodwork; filtered air does not darken the ceilings; filtered air does not dirty the draperies.

House Owners Everywhere are Easily Interested in Filtered Air

We have demonstrated this fact. Others have done so too. Filtered air is a logical, modern, scientific contribution to the business of heating homes. And the Reed Furnace Filters, for which we are national distributors, represent the experience and skill attained by building hundreds of thousands of filters now in use in office buildings, theatres, hotels, schools and banks. Nine years of success back of them. *They do the work* and are easily installed.

The Reed Furnace Filter is the essence of simplicity. It consists of a steel frame, scientifically packed to give minimum resistance to air flow. The filter media is a special galvanized crimped wire of small section, but having sufficient resiliency to prevent packing. It is installed in the cold air duct and the air passing through it is filtered before it gets into the furnace.

Install a Reed Furnace FILTER in Every New Job

and you will quickly make yourself one of the most talked of men in the business. People like it. They tell their friends about it and create new customers for you. Start now and build yourself a steady business through selling — not simply furnaces or heating systems, but *CLEAN AIR,* FILTERED AIR!

Write us for further information.

THE REED FURNACE FILTER

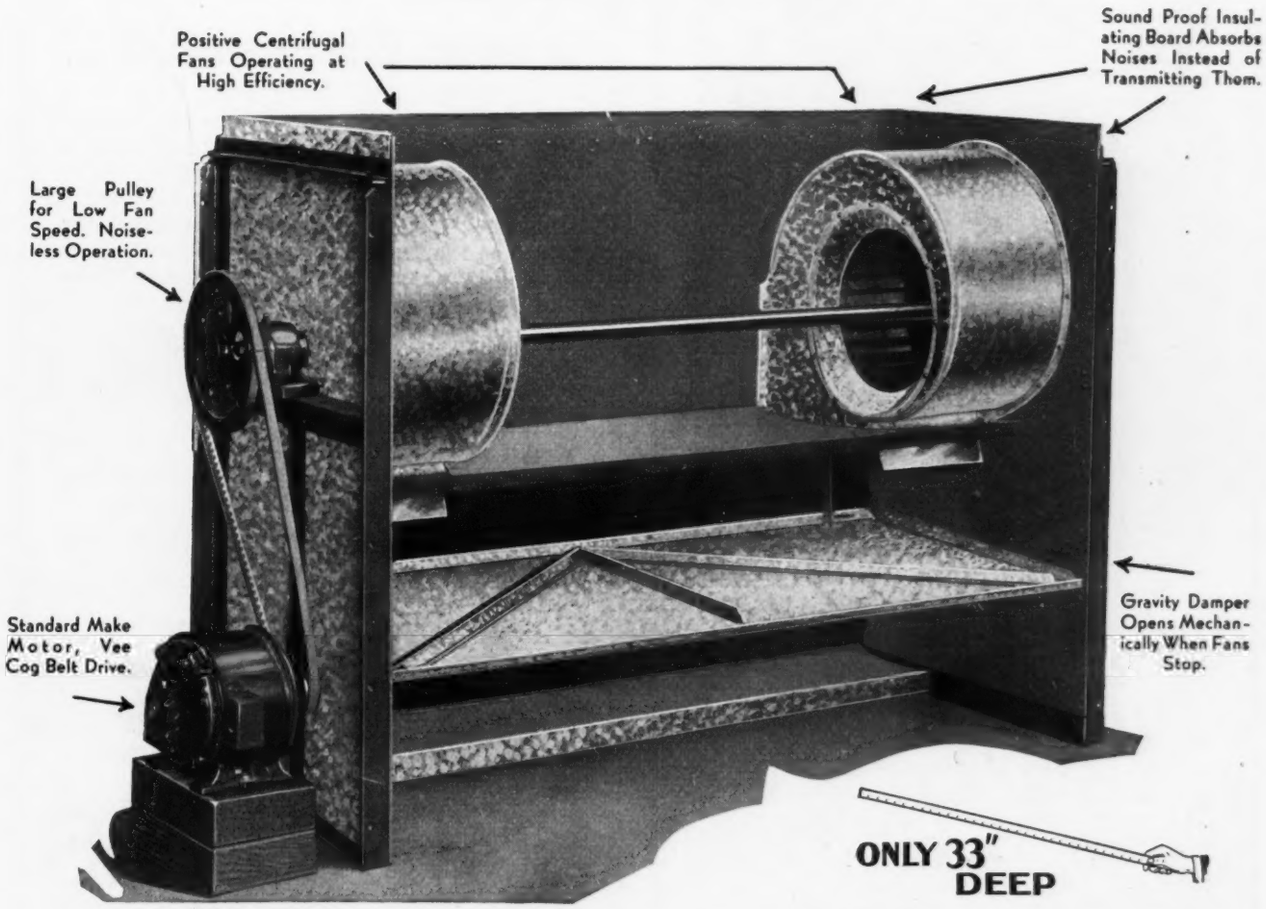
THE WARM AIR FURNACE FAN COMPANY

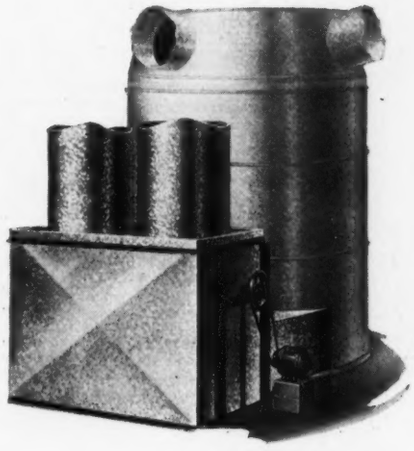
Exclusive National Distributors

6511 Cedar Avenue ❖ CLEVELAND, OHIO

BRUNDAGE FORCED AIR SYSTEM
For MODERNIZING WARM AIR HEATING EQUIPMENT

IN HOMES, FACTORIES, STORES AND PUBLIC BUILDINGS


Positive Centrifugal Fans Operating at High Efficiency.
Sound Proof Insulating Board Absorbs Noises Instead of Transmitting Them.
Large Pulley for Low Fan Speed. Noiseless Operation.
Standard Make Motor, Vee Cog Belt Drive.
Gravity Damper Opens Mechanically When Fans Stop.
ONLY 33" DEEP



HEATING CONTRACTORS: —TAKE NOTICE—

EVERYWHERE heating contractors are enthusiastic about the sales possibilities of the new Brundage Forced Air System. Brundage engineers have designed a system that insures silent and economical forced circulation for any type of warm air heating equipment. It is a unit you can guarantee to give positive satisfaction. It holds some real profits for you. Representatives wanted everywhere. Write for details of our interesting dealer proposition.

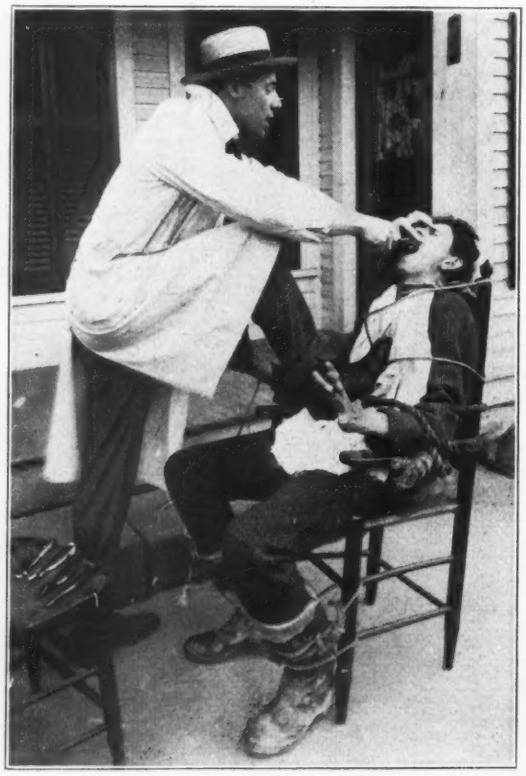
THE BRUNDAGE COMPANY
KALAMAZOO, MICHIGAN

FILL OUT AND MAIL TODAY

To
THE BRUNDAGE COMPANY
Kalamazoo, Mich.

Please send us your dealer proposition on Brundage Forced Air System.

Company.....
City..... State.....
Attention of.....



Are Your Sales Like Pulling Teeth?

SOME dealers have a devil of a hard time selling a furnace. They tug and yank at their prospects. The prospect howls bloody murder. It's worse than pulling teeth down on the farm. And it's poor salesmanship.

GOOD salesmanship is painless. That's why so many Premiers are being sold. Premier Dealers are better salesmen for the same reason that some dentists are better tooth pullers than others—MORE AND BETTER TOOLS.

HERE are some of the sales pulling tools Premier Dealers use in making painless furnace sales:

1. ***The New Premier 10-Year Guarantee (including the grates).***
2. ***The Premier Sales Buddy.***
3. ***The Premier Comparison Sheet.***
4. ***The Premier Prospect Service.***

IF you've just about reached the point of a nervous breakdown in trying to make furnace sales, better cast an eye over these Premier Sales Tools and find out just how easy and painless the whole thing can be.

We suggest that you phone, telegraph or write us without delay

PREMIER
WARM AIR HEATER CO.
Dowagiac, Michigan, U. S. A.

There never was a better time to start selling QUALITY *warm air heating!*

IN all the years you have been in business no season perhaps was better suited for a policy change than this present period. We're talking of course to some of you old timers who have batted along selling ***furnaces*** for years and making money in spite of your passing by such things as the Standard Code (until you ***had*** to recognize it) and the new order of selling ***heating comfort*** instead of so much weight at a price.

You've been finding business tough — prospects few—sales hard to close. One sure way to put new life to your business is to give your prospects something ***new***—something ***interesting***—something ***different.***

HOOK UP A BLOWER OR A FAN AND A FILTER TO—

THE PIPE AND ATH-A-NOR PIPELESS FURNACE

SMOKELESS

Besides the Ath-A-Nor, the May-Fiebeger line includes several styles and a complete range of sizes in both cast iron and steel furnaces. Every May-Fiebeger furnace is high grade and reasonably priced.

and set this display in your window. Watch folks take new interest ***in warm air heating.*** Then sell them a better ***heating*** job—and an installation that will ***cool their homes in summer.*** Show them how a modern warm air heating job with an Ath-A-Nor Smokeless saves fuel and provides powerful quick heating. Show them the famous Three-Way Air Blast which is an exclusive Ath-A-Nor feature. Your sales are ***bound*** to increase—and these sales bring you higher profits. Start now to sell ***better warm air heating.***

The May-Fiebeger Company
Newark, Ohio

Every furnace can be made to render permanently leak-proof service with

WAMPUM BRAND

LASTIK

FURNACE CEMENT

A superior product made by specialists who know what it must accomplish—

BEFORE Lastik engineers started to make Wampum Brand Lastik Furnace Cement they *first* found out what was needed. In all they spent two full years in research and investigation. They learned what furnace cement must endure under all conditions. Then they set out to discover ingredients to compound a superior product.

In producing Lastik Brand not only one or two objectives are reached but ***all*** technical requirements are met with the highest possible degree of perfection.

Odor is undesirable—WAMPUM BRAND LASTIK FURNACE CEMENT is odorless. Pliability is necessary so ***this*** cement is soft, smooth and easy to pack.

Wampum Brand Lastik Furnace Cement becomes hard under heat but NOT BRITTLE. It will NOT CRACK—it is non-porous, firmly knit and acid-proof. It does not shrink or swell. Under years of hard service it withstands the expansion and contraction action of cast iron.

Cement one furnace with Wampum Brand Lastik Furnace Cement now and let it prove itself—your Jobber will supply you.

LASTIK PRODUCTS CORP.

General Offices, Oliver Bldg.

PITTSBURGH, PA.

Also Manufacturers of LASTIK ROOF PAINTS and CEMENTS—LASTIKALK—LASTIK DAMPPROOFINGS

DEALERS—JOBBERS AND MANUFACTURERS

Permanently tight joints are absolutely necessary for the success of every warm air heating installation. Folks are buying Forced Air jobs, Oil Burners, Gas Burners and Air Filters. The importance of tight joints increases on jobs of this type.

Wampum Brand Lastik Furnace Cement is a SUPERIOR product and you can use and recommend it for making furnace joints PERMANENTLY TIGHT.

The list of furnace manufacturers who use Wampum Brand Lastik Furnace Cement is constantly growing—add extra value to ***your*** line of furnaces by adopting this ***high quality*** furnace cement.

Send the coupon today—

LASTIK PRODUCTS CORPORATION,
PITTSBURGH, PA.

Gentlemen:

I am interested in Lastik Wampum Brand Furnace Cement. Send me full details.

Name.....

Address.....

My Jobber is.....

☐ Dealer ☐ Jobber ☐ Manufacturer

Mention AMERICAN ARTISAN in your reply—Thank you!

SATISFIED CUSTOMERS

with the

Vernois

The large Radiating Surface, The One Piece correctly designed radiator and the careful proportioning of every part are a few of the reasons for the increasing prestige of the VERNOIS.

Fire and Ash Doors are large and carefully fitted.

Your choice of Ball Bearing Round Grate with upright lever shaker handle or the Duplex Anti Clinker Grate.

VERNOIS Furnaces are completely assembled and then knocked down before crating for shipment. We guarantee perfect fit.

Our catalogue gives full particulars. Write for it today.

Vernois Cabinet Circulator

VERNOIS circulators are handsome pieces of furniture, easy to keep clean and they produce a great amount of heat at small cost.

Vernois Gas Range

Mt. Vernon Furnace & Mfg. Co.
Mt. Vernon, Ill.

LENNOX TORRID ZONE STEEL FURNACES

An Emblem of Quality

The dealer who has never sold Torrid Zone steel furnaces has no conception of the many advantages this furnace line offers. To say you are familiar with Torrid Zone construction is not enough. There are, free engineering service, newspaper and dealer help advertising, financial aid, an unusual variety of furnace sizes, quick deliveries made possible by large warehouse stocks, and a score of other Torrid Zone service features of vital interest to every furnace dealer. Why not investigate for yourself Torrid Zone possibilities. Write for complete information on the Torrid Zone line.

LENNOX FURNACE COMPANY, INC.
Marshalltown, Iowa Syracuse, N. Y. Toronto Winnipeg

Warehouses in the leading cities

MONCRIEF FURNACES

The Series "C"

Send for catalogs

THE HENRY FURNACE & FOUNDRY CO.
3471 E. 49th St. Cleveland, Ohio

BRILLION FURNACES

Meet Every Quality Requirement

YOU would expect to pay much more than its unusually low price.

Its quality and design are way above its price class.

There's a reason but its no secret—just send the coupon today for full details.

BRILLION FURNACE CO.
200-300 Park Ave., Brillion, Wis.
Send me full details and Catalog No. 80.

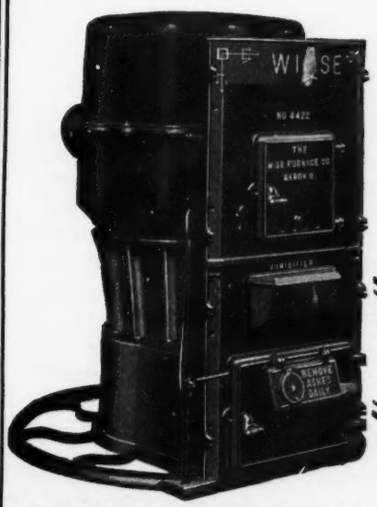
Name.....

Address.....

all your purchases from one source

WISE FURNACES

BELOW is shown the New Wise Steel Furnace. A Wise product and a steel furnace having exclusive Wise features. Notice the Cast Iron Soot Box and Clean-Out on bottom of Radiator—the weak spot of steel furnaces eliminated.



THE Wise Open Dome 40 Series with Self Cleaning Radiator is even better than ever with its new One-Piece heavy Cellular Firepot and new Elbow Shaped Collar on inside of radiator which is turned up so that all the heat must follow the castings to the top before entering the flue.

THE Wise 20 Series Return Flue Radiator has a new Patented radiator. Now cleaning the radiator is easy. The feed chamber and the radiator are designed so that the fire flues are easily gotten at from the upper feed door with the soot falling directly into the firepot. Also equipped with the new Cellular Firepot.

Write for catalog No. 23

The WISE FURNACE COMPANY, Akron, Ohio

Get your share of the available business with this sales getter

NEW *1000* SERIES

CHALLENGE

THE folks who will buy this season will prefer the Challenge. It's *new* and designed to render highest heating efficiency. Notice these features—Square-Back Ashpit — Triple-Seal joints — Lever Shaker handle—Straight line two piece fire pot and extending smoke pipe connections and pouches.

It has increased grate area—greater heating surface and increased Standard Code Rating also. A lighter and lower priced furnace but dependable and high grade in all respects.

Write for full details on the Challenge now

STANDARD FOUNDRY & FURNACE CO., De Kalb, Ill.

Also Manufacturers of Hero Air Washer and Titan Superheater Furnaces

For Better Heating

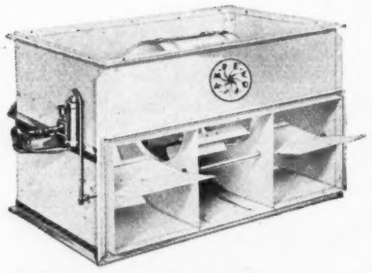
AM-PE'-CO

For Definite Cooling

ROTARY BLOWER

THE contractor who sells warm air heating with the Am-Pe'-Co automatically sells modern warm air heating. Prospects get the right picture of this superior method of heating and profitable and satisfactory installations result.

When you sell Am-Pe'-Co Forced warm air heating you are not bothered with petty price competition. Warm air heating the way ***you*** offer it becomes a different and higher class method of heating.



THE Am-Pe'-Co Rotary Blower is designed with Dampered Outlets. When the blower stops, the dampers open automatically. An Oil Pump and Regulator of our own design insures positive operation. Am-Pe'-Co has another exclusive feature — an air chamber back of blower housing provides fully balanced air distribution to both inlets and unrestricted entry of free air from top, side and bottom of inlets.

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Set an Am-Pe'-Co Blower going in your window and watch folks take keen interest.

It's a new and remarkable idea to most people.

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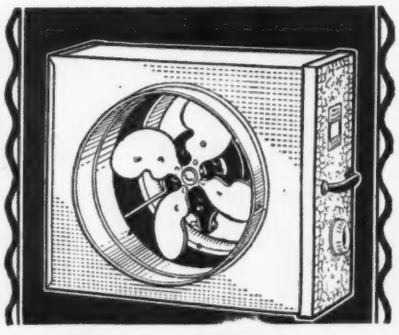
Write for full details now

American Machine Products Company

Marshalltown, Iowa

No. 9 size Unit with 10 inch Outlets, designed for average small home — Mercury Control, Heat Booster, Fan and Unit — *complete* including Automatic Control — to the dealer.....



$36.00

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A-C *Thermostatically Controlled* *Automatic* HEAT BOOSTER

YOU'LL find sales resistance easily broken when you talk *forced air* warm air heating. Remember most folks ***haven't even seen a furnace booster fan as yet.***

Demonstrate the action of an A-C Automatic Heat Booster in your window and watch your warm air furnace installations pick up.

The A-C is unusually efficient—its design and method of installation makes it truly effective. The Mercury Control makes it automatic—a feature unheard of on other fans selling at anywhere near the A-C price.

Easily and quickly installed in cold air by-pass. No noise—no vibration—no interference with gravity operation. Made in several sizes for all types of jobs.

Order through your jobber—write your jobber or direct to us for full details today

A-C MANUFACTURING CO.

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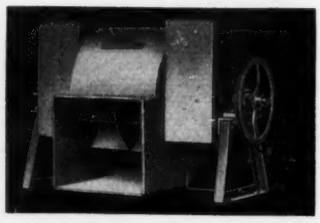
MANUFACTURERS have adopted FURBLO as standard equipment — jobbers catalog FURBLO exclusively —dealers everywhere find FURBLO the one and only satisfactory solution to the problem of mechanical warm air heating.

FURBLO is not a fan—but a blower. Quiet, efficient, powerful, sturdy, dependable. Guaranteed to always produce on even the hardest job.



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Two sizes fit practically all installations. Send for complete information.

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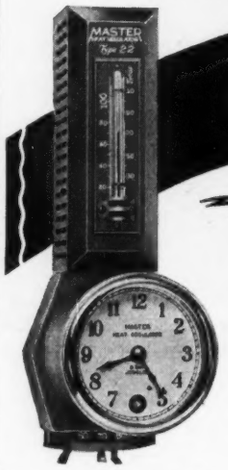

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Close Regulation—1° or Less

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Air Conditioning with the Warm Air Heating System

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Most folks still have the old picture of furnace heat—nothing will stimulate new interest in this best of all methods of heating like a ***forced air, filtered air, humidified air*** installation. The Korectaire machine does all three operations and does it efficiently, practically and quietly.

Warm Air Heating is taking a new and bigger hold on the public—You should profit by it

Get a Korectaire machine on your sales floor now. Show your prospects by a demonstration that it is—

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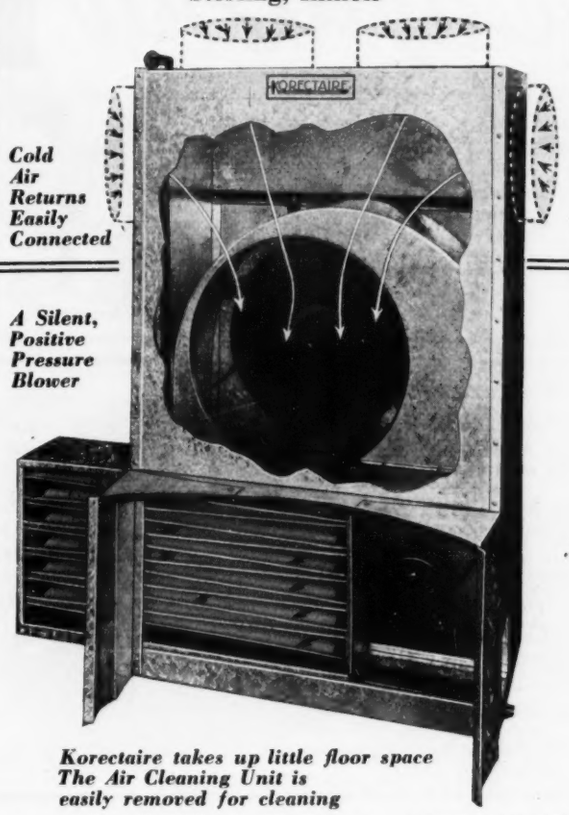
2. An Automatic Humidifier (with correct and ample water supply)
3. A Non Flow-Resisting Air Filter
4. A Cooling Unit in Summer.

The operation of the Korectaire will sell itself—you will land the job because this type of installation is preferred.

Be the one in your territory to provide this modern method of heating and air conditioning. Write at once for agency details and prices—ask for illustrated circular giving full description of this high grade machine.

Watt Manufacturing Co.
Sterling, Illinois



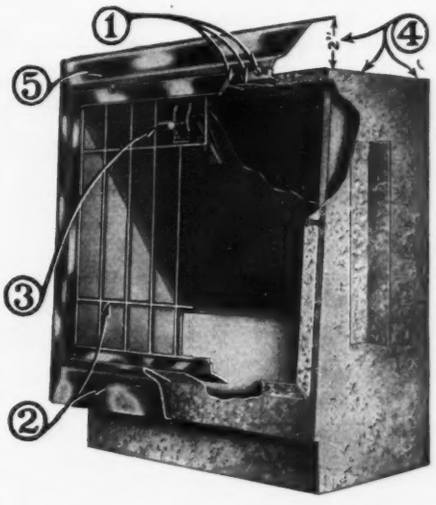
Cold Air Returns Easily Connected

A Silent, Positive Pressure Blower

Korectaire takes up little floor space The Air Cleaning Unit is easily removed for cleaning

THE expanding joint of register front to register box on the NO STREAK REGISTER *which prevents streaking of walls above the register*

IS AN EXCLUSIVE PATENTED FEATURE *which we Guarantee.*



That's why we talk so much about the cleanliness feature of

NO STREAK REGISTERS

This feature and many other construction features plus attractive design and finishes make it a LEADING sales getter — send the coupon.

ROCK ISLAND REGISTER CO.
ROCK ISLAND, ILL.

ROCK ISLAND REGISTER CO. ROCK ISLAND, ILL.

Please send me your catalog and price list today.

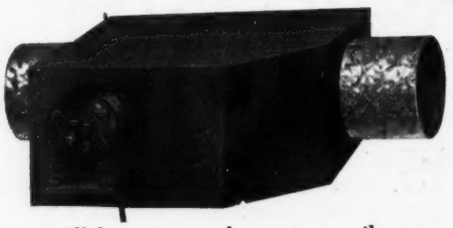
Name .....

Street and Number .....

Town ..... *State* .....

A Heat Hustler Fan Forces Air Through a Single Warm Air Pipe

Heats garages, sun porches and other rooms that will not heat by gravity. Mounts directly in the warm air pipe. Draws heat from the furnace and forces it into the hard-to-heat room. Quick heat for a bathroom.



Four reasons why you should use the American Heat Hustler:

1. It uses a positive pressure, rotary type fan.
2. Motor is outside the warm air flow, adding greatly to life of motor and leaving as much space for gravity air flow as before the Heat Hustler was installed.
3. It is quiet.
4. Furnished for either automatic or manual control.

Price list, with descriptive literature showing different models, sizes, etc., will be sent you by return mail upon receipt of your request. CLIP AND SEND THIS AD IN NOW!

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Bloomington, *World's largest manufacturers of blower furnace systems* **Illinois**

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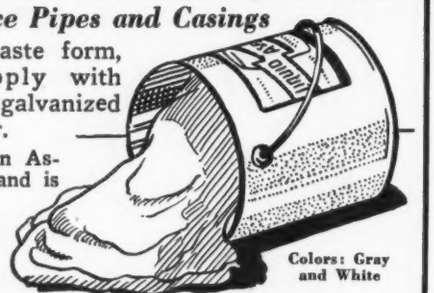
For Furnace Pipes and Casings

Comes in paste form, easy to apply with brush to tin, galvanized iron or paper.

Costs less than Asbestos Paper and is much better.



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Colors: Gray and White

LIQUID ASBESTOS MFG. CO.

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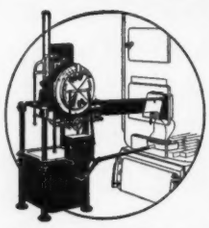

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The* McIlvaine *Method of Oil Heating

With the fidelity of a well-balanced scale, the amount of heat supplied by the McIlvaine Method automatically increases or decreases exactly as the temperature outside demands. Thus, an even temperature is maintained indoors, all winter long. The McIlvaine Continuous Flame Oil Burner (recommended by the leading warm air heating experts) with its five flame sizes, automatically balanced to the heat demand, gives positively satisfactory results, and is highly efficient when installed in warm air and other types of residence heating systems.

WRITE NOW

for dealer's proposition, sales plan and complete information.

McILVAINE BURNER CORPORATION

747 Custer Avenue Dept. A Evanston, Ill.

only* $48 *installed

dealer price $22.75

"SheerComfort" Heat Regulator gives all electric and fully automatic control over the draft and damper doors of home heating plants. Four exclusive safety features found in no other heat regulator at any price—yet costs less than any other electric regulator on the market. Ask your jobber or write H. M. Sheer Co., 213 Hampshire St., Quincy, Ill.

SHEER COMFORT

***heat* Regulator**

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To be sure of perfect fitting castings and parts, order only genuine AGRICOLA Repair Parts. Prompt shipments.

AGRICOLA FURNACE CO., Inc.

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Offices in principal cities

Your prospects will prefer the—

GILTEDGE FURNACE

and *you* will prefer the profits and prestige the agency bring you

SCHWAB FURNACE & MFG. CO.

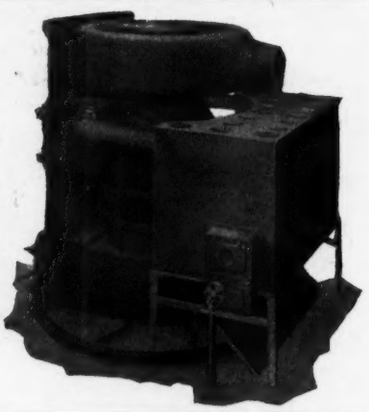
283 Clinton Street Milwaukee, Wis.

You can sell

GAS HEATING

to OLD as well as new customers with

The MUNKEL GAS ATTACHMENT



It fits any coal furnace—it heats both units giving extra large radiating surface. Simple, efficient, economical and easy to install. Stimulate business and make more profits with the Munkel Gas Attachment.

Write today for full details

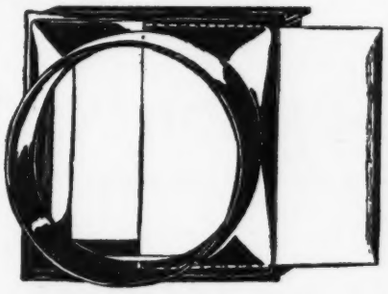
***The* MUNKEL-RIPPEL HEATING CO.**

"31 Years of Service"

Columbus, Ohio

Make an *extra profit* on every New and Old smoke pipe installation

"NO-DAMP"



It's a
1 Draft Control
2 Thimble
3 Protection Against Moisture
4 Pipe Saver

It sells on sight—It's easy to install

THE four-in-one purpose of the "No Damp" makes sales easy. "No-Damp" is made of cast iron. Every smoke pipe needs one no matter what kind of heat is used.

The slide acts as a damper—it keeps excessive moisture or water from reaching the smoke pipe or furnace in spring and summer. It eliminates necessity of taking down smoke pipe in spring—it makes a neat and substantial thimble if pipe is taken down.

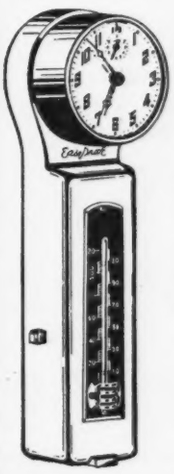
Be the one in your territory to sell "No-Damp"—write today for circulars and prices.

EISSLER HARDWARE
129-131 FIFTH STREET AURORA, ILL.

Is YOUR Home

Equipped for Cold-Morning Warmth on Arising? And Complete Upstairs Control of Your Furnace Drafts at All Times?

$10 Retail and has no Competition



30-DAY FREE-TRIAL OFFER to all rated Sheet-Metal and Furnace men who are not at present enjoying draft-control service in their own homes!

Prove the remarkable sales-rightness of "Easy-Draft," Mr. Furnace Dealer, by using it in your own home at our risk!

A phenomenal seller that is going over big wherever it is introduced. For Steam, Hot Water or Warm Air Furnaces. Not a thermostat—no electrical connections to bother with — easy to install — trouble-proof in operation — approved by Good Housekeeping Institute — marketed on iron-clad Money-Back Guarantee.

For Descriptive Literature and full particulars about this Special "Free-Trial" proposition, address

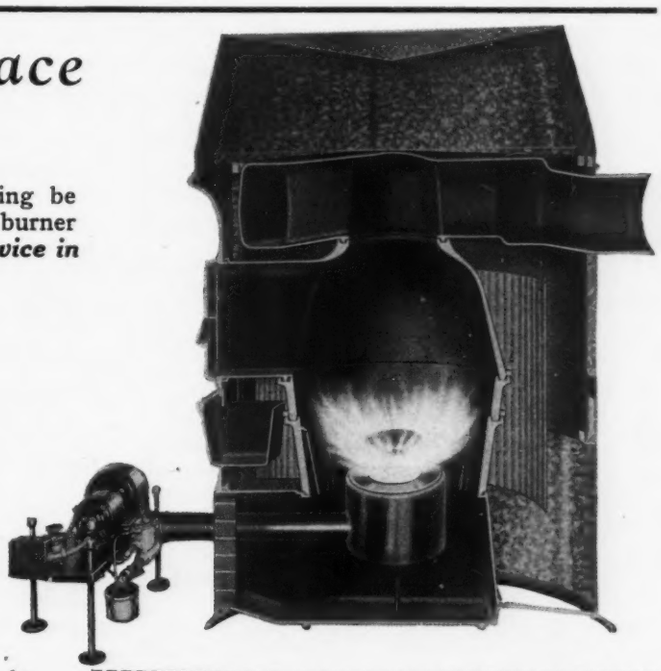
CHARLES TISCH, Inc.
93 Rockwell Place Brooklyn, N. Y.

The Warm Air Furnace OIL BURNER

WHEN your customers ask about oil burning be ready to sell them a Bock Burner—the oil burner that is especially designed for ***highly efficient service in a warm air furnace.***

The BOCK OIL BURNER

1. **Dependable and quiet.**
2. **Simple—only one moving part.**
3. **Specially built — full floating motor — no hum.**
4. **High and low flame operation. No ignition or gas pilot.**
5. **Even and efficient distribution of heat to all castings.**
6. **Automatic control—Ease of operation.**



THE Bock produces a steady full flame essential for heating efficiency in a warm air furnace. It is ***extremely*** quiet—another requirement for an oil burner to be used in a warm air furnace. Above all it is ***simple, reliable*** and high grade in all respects.

Unless ***you*** sell an oil burner especially adapted ***for use in a warm air furnace***—you are losing not only oil burner profits but possibly many warm air heating sales.

Folks want to burn oil and the Bock solves your problem. Send the coupon today

***The* BOCK OIL BURNER CORPORATION**
MADISON, WISCONSIN

BOCK OIL BURNER CORPORATION
MADISON, WIS.

Gentlemen:

I am interested in selecting an Oil Burner especially designed for use in the warm air furnace. Send me full details of the Bock Type V.

Name.....

Address.....

Town..... **State**.....

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VOL. 99, NO. 20

September 27

1930

Beginning next issue we are going to publish a series of articles by Platte Overton on heating different types of large buildings. Overton is one of the best heating engineers in the country and his series will be a real solution. Watch for them.

* * *

We would like to call your attention to the article on Overhead. This is a controversial subject and we are ready to have you shoot at the article. If there is anything on Overhead that's sticking in your craw, spit it out. We'll publish it if we can read it.

* * *

We got back a whole batch of coupons requesting a reprint of J. G. Dingle's articles on Cost Accounting. If any more of you readers would like to see this series in pamphlet form drop us a note. We can still use a lot more requests. Perhaps we're something like a radio station—thriving on listener interest—but those who intended to write and forgot can still do so.

Contents

Page

Let's Borrow the Engineer's Language 23
An editorial.

Overhead 24
Joseph G. Dingle says Overhead should be figured on labor and materials and he tells why. Perhaps you don't agree with him. If so, say so.

Twisted Connection for Gas Range 27
W. R. Haines, our contributing editor, works out a pattern for one of our readers.

A Poor Fan Blast System 28
Platte Overton, consulting engineer, takes a fan blast system apart and tells what is wrong with it. It seems to be mostly all wrong.

Reshingling with Metal Shingles 30
The story of a reshingling job on a group of school buildings where metal shingles were used for permanence and fire resistance.

Fan Fundamentals 32
G. A. Voorhees writes the sixth article on fans. This article tells how fan construction effects operation.

Co-operative Advertising 34
The Portland, Ore., Association is doing co-operative advertising. We show one of their ads and tell what they are doing.

A Church Heating System 35
A very interesting forced air system in a church. Full details are given.

Copper Work on J. D. Rockefeller's Houses 38
A copper gutter and downspout job on 81 high class houses in Cleveland.

Three-Piece Transition Elbow 40
L. F. Hyatt, our contributing editor, submits a simplified method of developing this commonly used elbow.

Gravity Exhaust Ventilation 42
Paul Jordan gives some pointed facts about the use of dampers in ventilators.

Random Notes and Sketches 44

Notes and Queries 45

News Items and News Items 46

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DOE-WAH-JACK
In our entire country there is no furnace that equals the
Round Oak
in air and gas tight fitting, heating capacity, durability and economy of fuel.
If you are ready to handle the best furnace made we shall be greatly pleased to have the opportunity to prove every claim we make.
Estate of
P. D. Beckwith
Dowagiac, Mich.
Makers of Good Goods only

1902

A reproduction of the ROUND OAK page advertisement which appeared in the April 26th, 1902 issue of

AMERICAN ARTISAN

1930

Today ROUND OAK FURNACES are still the standard of comparison---Nationally known for quality and healthful heating service

WRITE FOR AGENCY DETAILS

THE BECKWITH COMPANY, Dowagiac, Michigan

ESTABLISHED—1871

Say you saw it in AMERICAN ARTISAN—Thank you!

American Artisan

THE WARM AIR HEATING AND SHEET METAL JOURNAL

Vol. 99 CHICAGO, SEPTEMBER 27, 1930 No. 20

Let's Borrow the Engineer's Language

PROPERLY installing a warm air heating plant is an engineering proposition. Even though the heating contractor may not be an engineer the system which he installs has been worked out by engineers and the design of the furnace, the fans, the pipes or ducts, even the registers has gone through long engineering studies before it reaches the market. The Standard Code, likewise, has had the benefit of engineering experience and everything we do to air has its foundation in engineering.

If these things are true, why shouldn't the sale of a warm air heating system be an engineering proposition rather than the sale of so much cast iron, sheet metal, rivets and solder? Is there, we may ask ourselves, any advantage to be gained from such an idea?

Let's think of it in this light. First of all, the public today is engineering minded. How else can we account for the great interest in things mechanical, in things structural? Every automobile has a profound attraction for its owner. He would like to know what makes it tick and to the limit of his abilities he does delve into its intricacies.

How else can we account for the crowds which stand in front of every excavation watching the steam shovel at work, or before the new building watching the steel go up or the concrete mixer turn over? It's the appeal of engineering. The public likes to know the whys and wherefores.

This can be capitalized upon. If we go to sell a house owner a heating plant wouldn't it be just as easy to sell him in engineering terms as it is to sell him on iron and metal? Instead of talking about the furnace why not talk about a heating system? We might begin by talking about recirculation. Probably not more than one owner out of five ever thought of air circulating through his house. It should be easy to explain how the air is warmed and moves up into the house, where it cools, falls to the floor, is picked up through the return air system and brought back to the furnace where the process begins all over again. There's a world of interest in that simple engineering explanation.

And just so for the warm air side of the system. Most owners know that warm air rises. Why does it rise? They probably wouldn't ask because they do not want to appear ignorant, but we could tell them about the changes in weight of air as it heats up and how the heavier cold air coming into the casing at the bottom causes the warmed air to move up and through our pipes.

There's a lot of engineering in the furnace itself. Most owners have heard of a B. t. u., but they wouldn't know one if they met it in the alley. By simply telling them about a B. t. u., how there are so many imprisoned in each pound of fuel, how they are released through combustion, how they give off their heat to the metal of the furnace, how the air passing over these hot surfaces picks up the heat and carries it into the house, how the impetus of the warm air out through the registers and the pull of the cold air into the return air system sets up a positive circulation through every room is an engineering story that any home owner will delight to listen to.

The thing to do is to tell the story using engineering terms. These terms do not have to be jaw breakers, nor so technical that we can't explain them ourselves. What we are after is the engineering phrases. We want this phraseology simply for the effect. If the public thinks we are selling them something which is really technical, something which has required years of experiment and study, they feel that they are getting more for their money. They like to buy these technical and complicated things so that they can brag about them and discuss them with the neighbors, compare their plant with others and if we can give them some phrases which will stick in their minds then we are giving them something to talk about.

If we talk engineering language we satisfy this need.

OVERHEAD

"It Should Be Applied On Labor and Materials"

JOSEPH G. DINGLE

FOR several months, the ARTISAN has had articles on Cost Accounting. These articles have carried the reader along the path of better bookkeeping and attempted to teach him some of the essentials of the art. A full discussion of the accounts to be used; the material tickets, time cards and cost sheets, also the journals have been illustrated. Article VIII discussed the Balance Sheet and Operating Statement.

We now wish to take up the question of applying overhead. First, let's get a clear conception of just what we mean by "Overhead." If you will refer to Article VIII, August 2nd issue—page 20. you will find a skeleton outline of an Operating Statement. This Operating Statement is made up of several separate and distinct parts. There is the Sales—the amount paid by the customers. There is the Cost of Sales; that is, the cost of the material and direct labor sold. Deducting the Cost of Sales from the Sales, we arrive at Gross Profit. Then we have our Expenses. These are incurred in the operation of the business but, unlike the material and direct labor used in Cost of Sales, these Expenses can not be allocated specifically to each job. These Expenses, then, constitute our "Overhead," which must in some fair and equitable way be added in as a part of the cost of work done, in order that each customer may pay his part of this indirect expense. After deducting Expenses from Gross Profit we have our Net Operating Profit. Overhead, then, is that expense of the business which cannot be specifically allocated against definite jobs—and, as a result must be spread ratably over all jobs.

The business man who has good books and prepares Operating Statements for each year has a big advantage over those who do not have such records. The new man in business has no prior data on which to base his overhead application. He must guess, or estimate, what his year's results will be and proceed on that guess until he has some actual figures to use.

How Overhead Is Applied

Overhead may be applied in many ways. Some advocate applying it against material only; others claim that it should be applied against labor only, while another group claim it should be applied against the total of material and labor. Let's take a careful look at the matter and see which of these three is best adapted to the average sheet metal shop.

1st: Our problem is to add to our actual direct costs (material and labor, or either of the two) a "load" which, according to our best information, will return to us the actual outlay for our Overhead.

2nd: Our business is the put-

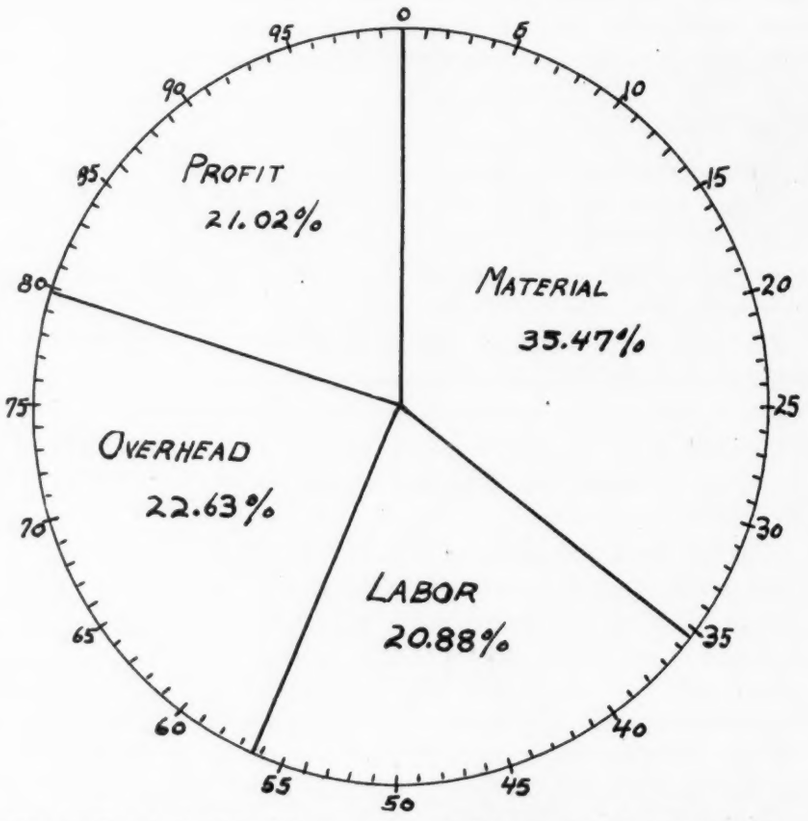


Fig. 1—Here is the financial setup of an actual furnace and sheet metal shop. These figures are for the year 1929. During that year material ran heavier than labor—it might have been the reverse. Profits were pretty good, but overhead was just a little higher than profit

We all know there is such a thing as overhead and that it is a whole lot larger than we used to think it was. The big argument now is—ought I figure my overhead on the cost of materials and labor, or on the cost of productive labor, or on the cost of materials? We know that taking one percentage for overhead and applying it on labor alone or applying it on labor and materials won't give us the same answer. Which is right? Read this article and tell us what you think.

ting together, in salable form, certain materials and labor. Some jobs require more material than labor while other jobs require more labor than material. There is no uniformity of the work. Needless to say, we usually have some material and some labor in every sale.

3rd: If, by analysis of the Overhead expenses, it were possible to say that certain items were directly related to material and others were directly related to labor, we might find some means of loading material costs with a part of the Overhead and the balance against labor cost. This, however, is, in my opinion, impossible. Take rent, for instance. You might say we require the shop to keep our materials in, and it should be charged against material. If we had no shop, where possible customers could find us, we might not need our men as our business would be smaller.

4th: What is the logical method of pricing a job? Do you not first take off your materials and price them? Then estimate the cost of the labor required to convert those materials into usable form for your customer. These two steps are, I believe, standard procedure in building up an estimate. That being true, don't you think it wise to conform, as near as possible, to standard procedure in our routine work? We have, then, two known figures—the cost of materials and the cost of direct labor, both estimates but we are going to use them. How to apply our overhead is now the big question.

A Specific Example

In order that we may have some figures to work with, I give you, in accompanying illustration, the result obtained in 1929 by a live wide-awake shop owner in a small city. These figures are real. The ARTISAN, in the issue of June 21st, carried an article on Estimates, based on this shop's operating figures for 1929. Read that article again. It will help you greatly in getting the best out of this one.

These figures show that the average $100.00 of sales contained the following elements (Fig. 1):

Material	$35.47	or 35.47%
Labor	20.88	or 20.88%
Overhead	22.63	or 22.63%
Profit	21.02	or 21.02%
Total	$100.00	100.00%

For our convenience, I have computed the percentage overhead bears to Material: to Labor,

Joseph G. Dingle, C. P. A.

and to both Material and Labor, as follows: (Fig. 2)

Material Cost, $35.47; overhead, $22.63 or 63.80 per cent of material.

Labor Cost, $20.88; overhead, $22.63 or 108.38 per cent of labor.

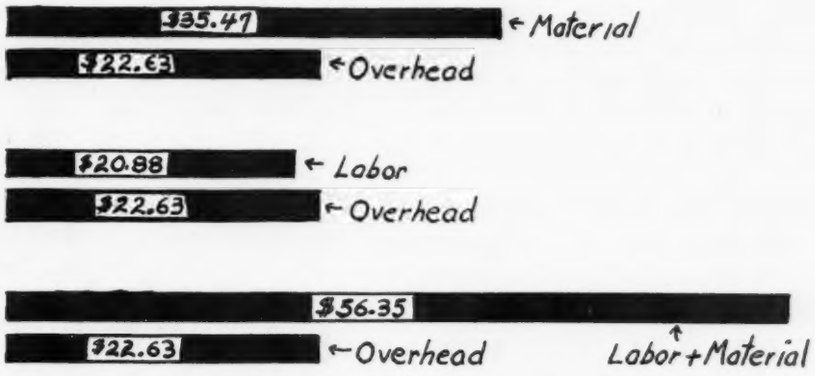


Fig. 2—Here is the same shop shown in Fig. 1 with the overhead computed to labor, labor and materials, and to materials. Notice how wide a difference there is between the overhead percentage to these three different items

Material and Labor Cost, $56.35; overhead, $22.63 or 40.16 per cent of material and labor.

With these percentages we are able to make a few computations. We will leave our profit of 20.01 per cent stand for a time. What we are after is that "Overhead." We will assume that our business will be about the same as it was in 1929—no increase or decrease in sales volume or overhead expense.

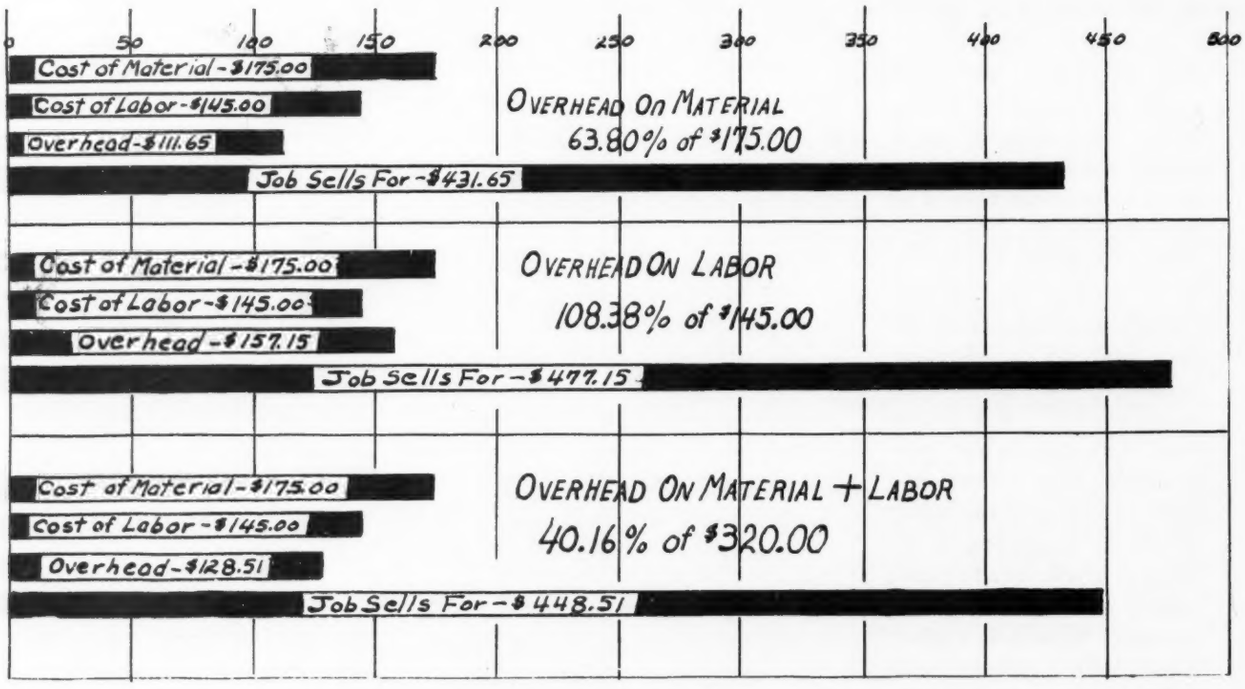


Fig. 3—Here is a graph showing overhead applied to the costs of one specific job. Material and labor costs are the same in each instance. Applying the overhead used in Fig. 2 to the costs, we find that we get a different set of figures representing what our job should sell for

Let's take a job on which we find materials costing $175.00 and labor $145.00, a total of $320.00 for material and labor. Using this, let's apply our overhead on each of the three bases mentioned above. (Fig. 3)

MATERIAL COST ONLY:

Material	$175.00
Labor	145.00
Total	$320.00
Overhead (63.80% of 175.00)	111.65
Total Material, Labor and Overhead	$431.65

LABOR COST ONLY:

Material	$175.00
Labor	145.00
Total Material and Labor	$320.00
Overhead (108.38% of $145.00)	157.15
Total Material, Labor and Overhead	$477.15

MATERIALS AND LABOR:

Material	$175.00
Labor	145.00
Total	$320.00
Overhead (40.16% of $320.00)	128.51
Total Material, Labor and Overhead	$448.51

Analysis of Results

Right away you will say the three methods produce different results. Of course they do. You ask why? The answer is that in determining our percentages for material alone and labor alone, we used the actual figures for 1929. There we had material costing $35.47 to labor $20.88. In other words, the material and labor cost totaled $56.35, of which 62.95 per cent was in material and 37.05 per cent was labor, while in our illustration above of $320.00 for material and labor, materials is 54.69 per cent of the $320.00 total and labor 45.31 per cent.

Where we have a job with 54.69 per cent material and apply overhead on material alone we will, naturally, load it with less overhead in proportion to total material cost than where material amounts to 62.95 per cent. The same principle applies to the loading of overhead on labor alone. Of course, if, at the close of the year, our material should amount to 62.65 per cent of the material and labor cost—as it did in 1929, our figures would prove out very nicely. This, however, is not likely.

The customer whose job carried more material than labor benefits by the loading of overhead on material. He pays $111.65 overhead, while, if the loading was on labor he would pay $157.15 as illustrated. Where Overhead is loaded on Material and Labor, our customer pays $128.51. If it were all material and no labor we were selling him for the $320.00 he would still pay $128.51 overhead. Or if it were $300.00 Labor and $20.00 material, he would pay $128.51 overhead.

Our object is to charge our customers with a proper proportion

(Continued on page 29)

Twisted Connection for a Gas Range

For a Subscriber in Carlsbad, N. Mex.

By **W. R. HAINES**
Contributing Editor

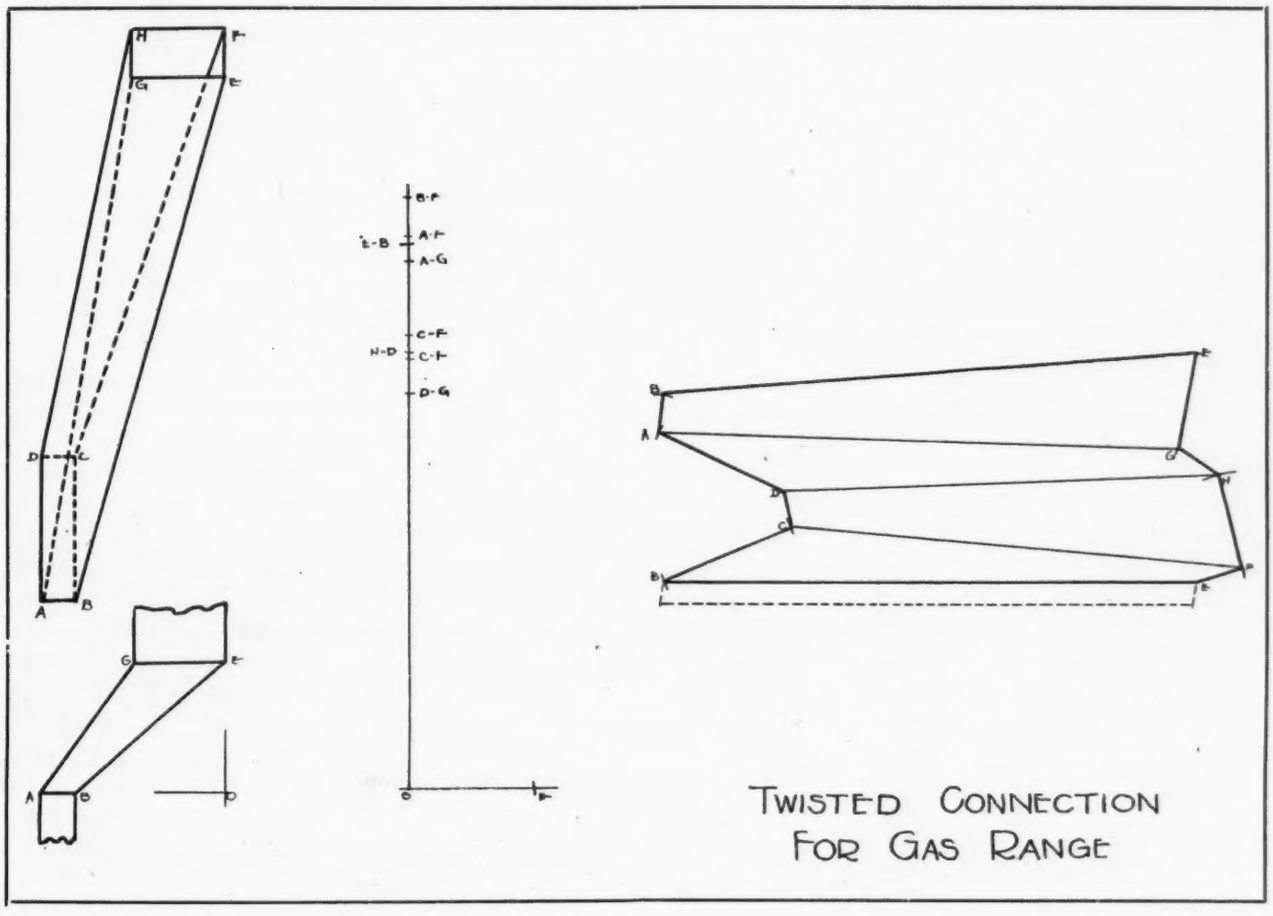
THIS layout of a twisted connection on a gas range was requested by a subscriber in Carlsbad, New Mexico.

It has two rectangular openings, one 6″ x 1½″ and the other 4″ x 2″, offsetting in plan 18″ one way and 6″ the other. The long side of one is parallel with the short side of the other, which of course requires a twisted connection from the two mitres or angles.

The elevation is shown in one place and the plan and perspective together, as I think it will be plainer. The sides of this fitting are flat, therefore can be divided into two triangles. For example, side B, C, F, E, can be divided into two triangles, thus B, C, E and E, F, C. One side of the triangle is distance OE in elevation. The other side is line as shown in plan.

To find true length of line BE, use BE in plan as one side and OE as the other, lay out true length. EF and AC are shown as true lengths. Draw an arc from B with BC as a radius. Draw arc from E with EF as radius. Find true length of BF and with this as a radius from B, strike arc. Where BF and EF arcs intersect is point F. Find true length of CF. Use as a radius and from F strike arc. Where arcs FC and BC intersect is point C.

Follow this system until all four sides are finished. To make the short stubs from the two angles is a simple matter. I have shown the seam on one corner. Any type of seam may be used except a Pittsburgh lock, which I consider out of place on a small job in a kitchen unless it can be concealed next to the wall.



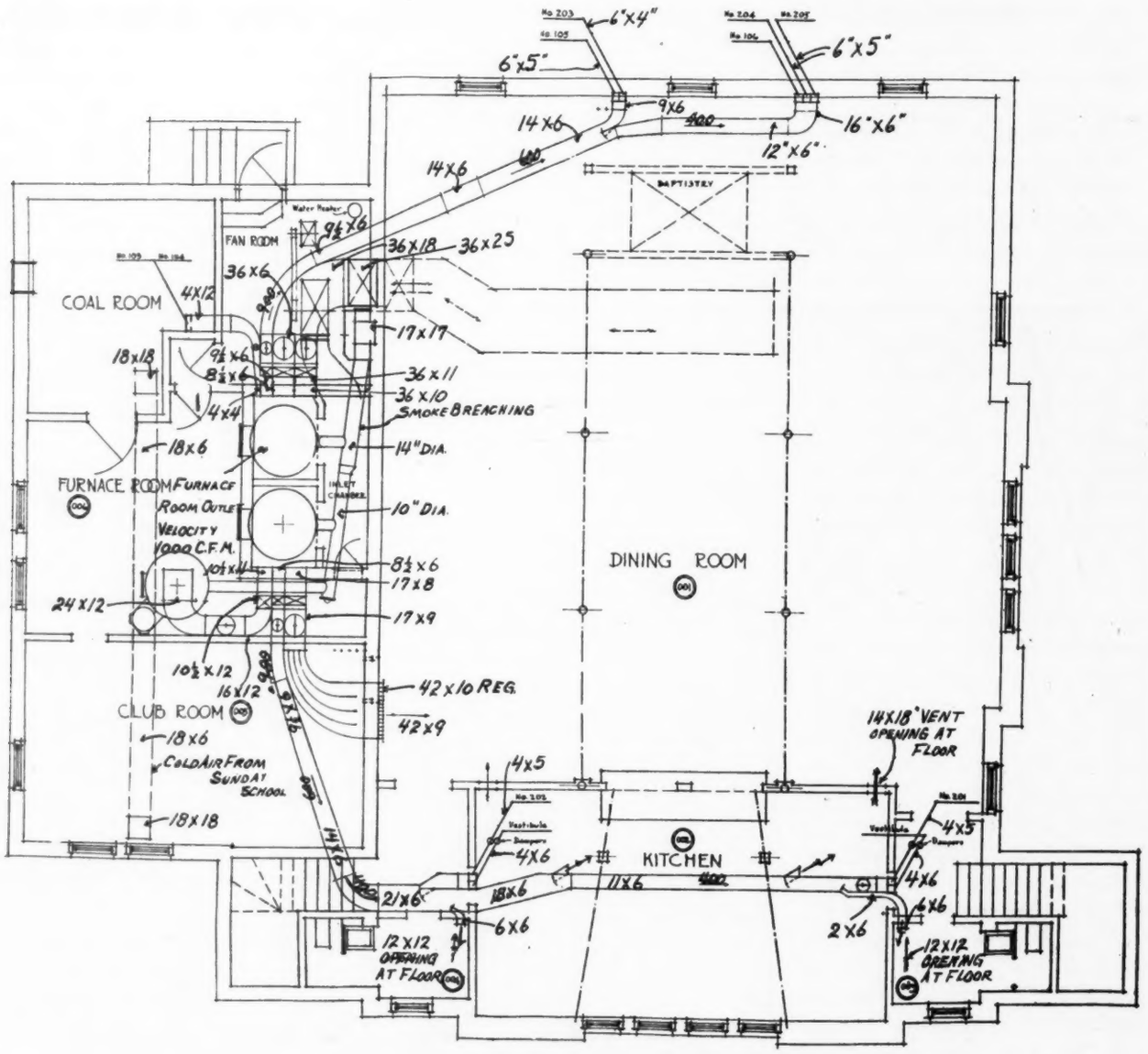
What Is Wrong With This Fan Blast Layout?

By **PLATTE OVERTON**
Consulting Engineer

THIS article should be headed "What is right" and the explanation would at least be brief. With such a heading the writer might point out that the heaters were placed in the furnace room and thereby end the story.

As we have only a print of the basement plan no attempt can be made to estimate the actual requirements of the building. All churches are difficult to heat. They generally stand for days without heat and become thoroughly cold. For this reason alone the apparatus must be oversized to compensate for the over load that must necessarily be experienced in heating up after a prolonged cold spell.

No building of this type can be properly heated with a "15 minute"



This is the heating system as laid out by the architect. Overton says this is a good example of "how not to design a heating system." Just trace out the various ducts and see what velocities the architect expected to force through small ducts. Note also how the ducts vary in size and capacity

Sooner or later every warm air heating man gets a church job. Some contractors make a specialty of these jobs. Every contractor who does this work has run into the architect who thinks he knows all about heating.

The job told about here is one such. The contractor told the architect it wouldn't work, but the architect was stubborn. It doesn't work. Platte Overton takes the big mistakes apart and tells what is wrong. Read and see if you agree with him.

air change as scheduled on this plan. There is a well founded rule for church heating that maintains that the inlet temperature at the grille or inlet should be only a few degrees in excess of the room temperature to be maintained or in other words our Auditorium at 70 deg. should be heated by air issuing at the inlet grille at not to exceed 80 or 85 deg. This invariably calls for an air change every six or seven minutes. Our Auditorium with a cubical content of 37,800 feet as scheduled would require a minimum of 5400 C.F.M. We note that 2520 C.F.M. has been supplied. With this gross miscalculation so evident we may draw our own conclusions about the balance of the schedule.

We refer to the duct layout for further enlightenment, and here find a fine example of how not to design a piping system. The writer has designed hundreds of Fan Blast systems both steam and warm air and has been guilty on occasions of designing ducts for minor rooms as small as 6x8 inches and at times still regrets it, as no duct should be smaller than 72 square inches in area, unless close to the plenum chamber and then 50 to 60 square inches is a minimum. A glance at the plans gives us a fine array of ducts, 4x5, 4x6, 6x6, and one very neat little fellow 2x6 inches. However, the grand prize of one petrified batter sponge goes to the 4x4-inch duct from the plenum chamber to rooms 103 and 104. Warm air risers that are handicapped by size are also placed on outside walls. We stop here a moment to wonder what the church committee think of Warm Air Fan Blast heating in general and pass on to the Fan room. Here we find the inlet of the fan 12 inches from the wall. In all cases the fan wheel should be as far from the wall or partition as the diameter of the wheel. As we assume a wheel of 30 inches in diameter the error is obvious.

The fan in the schedule is given a capacity of 5655 C.F.M. against ⅝ oz. S.P. which is equivalent to 1.08-inch S.P. 296 R.P.M. and .92 brake horse power. Where such a fan could be selected will remain a mystery. 1.08 inches of static pressure is too high for any warm air fan blast system. ⅜-inch to ½-inch is good practice.

No information is given on the capacity of the heaters, but if they were 100 per cent plus they would still be handicapped by the system.

Room 005, "Club Room," shows no inlet or exhaust and Rooms 004 and 003 are toilet rooms and show return opening into the dining room and are not on the schedule for supply.

Only one return is indicated and while this might be practical no fresh air intake is shown unless the outside door is utilized for this purpose.

Vestibules are supplied with 4x6-inch risers. All vestibules should be supplied with an over supply of air at maximum temperature to create an "out" draft when outside doors are opened. This tends to prevent a cold draft on the Auditorium floor. One 4x6-inch duct will carry enough air to warm a telephone booth if the door is kept closed and the exposure is "nil."

The designer of the above system must be given credit where credit is due. The installation of the "inspection" door into the inlet chamber was a piece of rare judgment. Any heater installed would require inspection after each firing.

A few more installations such as the above plan and the warm air fan blast contractors will return to the bench to solder wash boilers and glaze "busted" storm sash.

OVERHEAD

(Continued from page 26)

of our overhead. We sell, in varying amounts, both labor and material. Loading on Material or on Labor alone penalizes the customer using more of the one we load, and lets off with little overhead charge the customer buying the commodity on which we do not load. Loading Overhead on Material and Labor lets each customer pay his share of the indirect expenses regardless of the type of job he has done. If it be a furnace job and we load Overhead on Material, his price is going to be very high. If it be a furnace repair job—little material—and plenty of labor, we are, in this case actually giving him a bargain.

Of the three methods, then, I am thoroughly convinced that for the average small warm air heating and sheet metal shop we should load Overhead on both Material and Labor. It gives all jobs a chance. Regardless of whether heavy in Materials or Labor, the sum of the two is the base on which we load. The customer pays for what he gets — and nothing more nor less.

If one shop uses one basis for

(Continued on page 41)

This is one of the remodeled buildings. The roof is covered with metal shingles. Metal ceiling is also used throughout the interior. The enhanced appearance is worth many times the cost of the remodeling

A School Remodeling Job Using 400 Squares of Metal Shingles

THE state boys school at Plainfield, Indiana, is one of the oldest institutions in the state. The buildings were erected many years ago, in fact, some of the buildings are older than immediate records. The roofs of these older buildings were covered with cedar shingles laid on a light rafter construction, also of wood.

Like most other public institutions, maintenance was not always as regular as it might have been and the cedar shingles kept out the weather for a great many years without repair, except to direct leaks. A few years back, a remodeling program was inaugurated and one of the things the trustees felt ought to be done was to cover the roofs with some more modern and more permanent type of roofing.

The institution had also had one or two small fires which had shown the value of fire-resistive roofing. At the same time, the trustees wanted to look into the matter of putting on a roofing material which could be laid right over the old shingles if this plan was adopted.

Among the buildings was an old barracks which years previously had been covered with metal shingles. Through the years this metal roof had not given one speck of trouble nor required any expenditure for maintenance. During its life the cedar shingles had had to be repatched and repaired and the comparison between the two types had become evident to all the officials and the trustees.

There was, then, some considerable preference for metal roofing. Just about this time the old blacksmith shop had a fire and had to be remodeled. The officials decided to look into the metal shingle proposition and called in several companies who explained how resistive to fire and how maintenance-free the metal shingle roof was. Some forty to fifty squares of Milcor Spanish Metal Tile were purchased for the roof of this remodeled building. A very high grade shingle was bought, the shingle selected being made of I. C. copper alloy roof terne double-coated galvanized after formation. The quality shingle was selected because the institution wanted the shingles to last for many years without trouble or expense.

It is interesting to note that at the same time the officials decided to use metal ceiling throughout. This was purchased to be nailed onto sleepers right over the old

plaster. And the metal ceiling was also selected for its maintenance-free qualities.

Some months went by after the remodeled blacksmith shop was turned into a barracks. The officials watched the behavior of the metal shingles under all kinds of weather and through long cold and hot months. The shingles met every requirement.

The behavior of this first metal shingle job was so satisfactory that the officials wanted to cover the other buildings included in the remodeling program with metal. The matter was taken up with the state authorities responsible for appropriations for the school. The matter was passed upon favorably and the 1929 budget carried enough money to cover all the buildings with metal shingles.

The eight buildings included in the program were measured up and found to require some 400 squares of shingles. This amount of shingles was subsequently purchased. During 1929 and through this spring the forces employed to put on the shingles have been at work and just recently the entire job has been completed. Now all the old buildings are covered with this fire-resistive and modern type roofing.

This picture shows how the shingles are laid up one of the hips. The hip shingles turn out at the bottom to form a moisture seal for the main roof shingles. This picture also gives a good idea of how heavy the shingles look

The photographs which accompany this article show views of the roofing in process of erection. The shingles are put on beginning at the eave and laying up to the ridge. The pattern corresponds to the heavy clay tile of the Spanish houses and buildings of our Southwest. The corrugation is heavy and the finished roof has the appearance of a very heavy tile roof.

This appearance is somewhat deceiving in as much as the shingles are light in weight and unlike tile of the same pattern do not require heavy rafters and sheathing to keep the roof from sagging. On all these buildings the metal tile were laid right over the old shingles.

A scaffold was built all around the building and the workmen began to lay along the eave. The rows were then lapped up to the ridge where a special ridge roll was put on. The hips were covered with another special type shingle which laps over up the hip and also laps over the shingles of the roof.

The shingles are all nailed and no soldering is required.

On the building shown, the wall panels around the windows were covered with stucco and the porches covered with metal tile.

The shingles, as their name implies, are made by the Milcor Steel Company, Milwaukee. The local distributor was the Standard Metal Company, Indianapolis, Indiana.

The finished appearance is very similar to that of a heavy clay tile roof. But with metal shingles the weight is reduced to a fraction of the weight of clay. The appearance is all that could be desired

FAN FUNDAMENTALS [Part VI]

With Particular Reference to the Use of Fans in Heating

By **G. A. VOORHEES**
Heating and Ventilating Engineer, Indianapolis, Ind.

Since the propeller-type fan moves air in a direction parallel to its axis of rotation, the movement is accomplished with no change in direction of air flow aside from a spiral motion on the discharge side of the fan plus a certain amount of turbulence that occurs whenever any fluid is agitated. (See Fig. 1.)

The centrifugal or blower type fan on the other hand, compels several abrupt changes in direction of flow and these changes take place at a relatively high velocity.

Passing from the cold air duct to the fan inlet (point "A," Fig. 2), the entering air usually makes a 90-degree turn and flows into the fan in a path parallel to the axis of rotation. At point "B" the flow changes from axial to radial, another right angle turn. A third abrupt turn occurs where the air leaves the blade at point "C" and is deflected toward the outlet by the scroll housing.

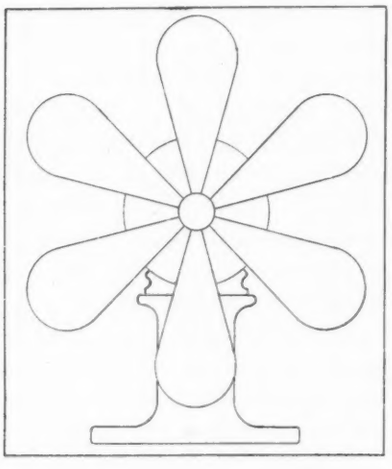


Fig. 1
The propeller-type fan moves air straight ahead. Air is sucked through from the back and blown ahead of the blades

G. A. Voorhees

In addition to the energy consumed in making these sharp turns, there is the friction of the air against the blades and the still greater friction against the inner surface of the fan housing.

Thus it seems reasonable to suppose that the blower fan will consume more power than the similar propeller fan in moving a given amount of air. Under "free delivery" conditions where there is no piping attached to either the intake or discharge side of the fan to cause frictional resistance, this is decidedly true. It is also true where the fan is delivering air against *slight* resistance.

But if the resistance to be overcome is relatively large, due to long and sometimes rather complicated trunk line systems, or to small pipes which mean high velocity, or to filters or any of the several causes of friction losses, then the reverse is true and the centrifugal fan is found to be much more efficient than the simpler propeller type.

In the case of high static pressure (frictional resistance) if a propeller fan does deliver the required volume of air, it has to operate at high speed which not only increases the power cost, but also invites complaints of noise.

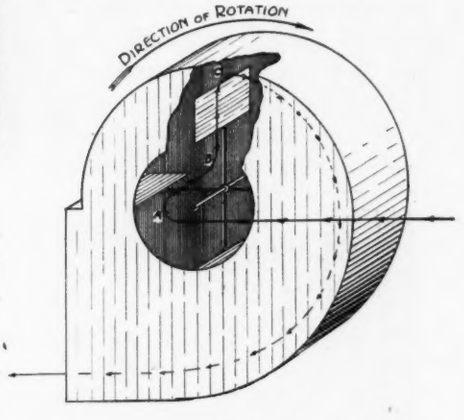


Fig. 2
The blower-type compels several right angle turns in the air movement. The air is sucked into the housing along the axis of the fan, is whirled out through the blades and against the housing. A turn is made into the blades, another at the housing and still another as the air leaves the housing

Briefly, the outstanding advantages of the centrifugal fan for warm air furnace installations are:

(a) Ability to deliver air

against relatively high frictional resistance.

(b) Power economy when operating against high static pressure (frictional resistance).

(c) More accurate performance data.

These characteristics of the centrifugal blower make it the logical fan for all systems where the pipes are small and the air consequently travels at high velocity through the ducts. If, for example, oil or gas is the fuel used, the heat generation is intermittent and the fan operates only when the fuel is burning (and for a short while afterward until the residual heat of the furnace has been utilized). In such a case nothing is gained by providing for gravity circulation and the ducts, both warm air and cold air, can be made quite small, the air moving at a correspondingly high velocity. Such a plant has the advantage of occupying very little space for piping. The same is true of a plant using solid fuel if the fan is run continuously while there is fire in the furnace.

The simplest centrifugal type is the old fashioned paddle-wheel

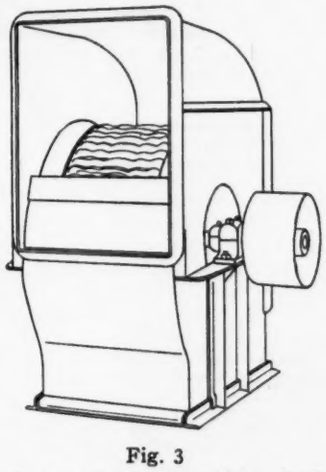


Fig. 3
This is the "single width, single inlet" type blower. The blades are of the vane type, that is wavy along the edge. The general curvature of the blades is forward

fan (Fig. 2) which is now obsolete and which had a small number of large, flat, radial blades.

A newer development was the multiblade fan having from 48 to 64 narrow blades and such fans have been widely used for a number of years in heating and ventilating work. Fig. 3 shows a "single width, single inlet" type and Fig. 4, a "double width, double inlet" fan of the multiblade type. Such fans have forward curved, backward curved or straight radial blades (Figs. 5), the forward curved blades being most commonly used. The new Miles blower has a forward curved multiblade wheel.

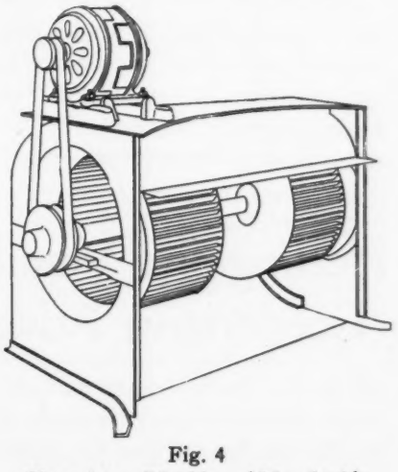


Fig. 4
Here is a "double width, double inlet fan. Air is taken in through an inlet in either end of the housing and discharges through a single throat. In some fans of this type the two squirrel cages are balanced on the ends of the motor shaft with the motor between the cages

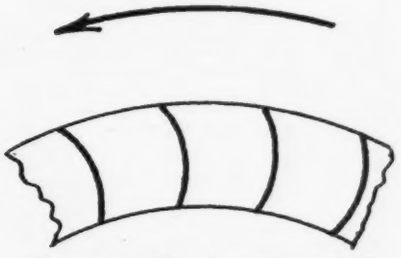


Fig. 5A — The forward curved blade is most popular today. The fan can be operated at lower speeds, which reduces noise, it has a higher air velocity

A number of the recently developed furnace fans have from six to a dozen or more forward curved blades. In the number and size of blades they resemble the obsolete paddle-wheel fan but the forward curvature of the blades increases the air velocity for a given fan speed and makes

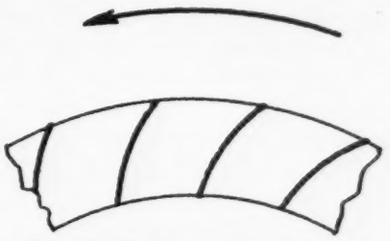


Fig. 5B—Backward curved blades have their advocates, but the fan has to run at higher speeds to get the same velocity as the forward curved blade type. In furnace work, the lower speed means less noise. There are several well known fans of this type, however

them quite effective for furnace systems. The Silentaire, Furblo, Am-pe-co and Brundage are fans of this type.

Backward curved blades must be operated at higher speeds than the forward curved type and, while they have certain very desirable characteristics for some classes of service, they are not well suited to furnace fan systems.

Furnace fans should be almost

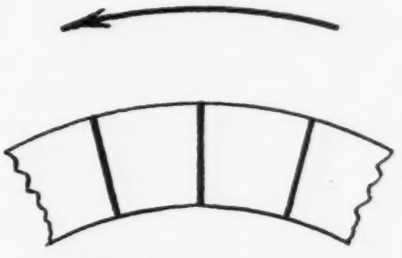


Fig. 4C—This represents the old paddle wheel type blade. This was the standard for many years, but has been supplanted by more efficient, quieter fans

noiseless except in industrial installations and the centrifugal fan with its usual belt drive, permits low fan speed even when used with the efficient standard speed motors. Fan noise comes from mechanical vibration which increases with the fan speed, and from "air noise" which in turn, is due to high air velocities that accompany high fan speed.

In selecting a centrifugal fan for a plant in a residence or church where noise is particularly objectionable, a large fan running at low speed is desirable even at some sacrifice of mechan-

ical efficiency, and in spite of a somewhat higher price. The increased investment in equipment and the slightly higher operating cost is amply justified by the quieter and more generally satisfactory operation.

It is desirable in this connection to distinguish between mechanical efficiency and "service efficiency." The mechanical efficiency of a fan is expressed by the ratio of the air horsepower output to the brake horsepower input and it is therefore a definitely commensurable and highly important item in any technical comparison of fans.

Service efficiency might be defined as including along with mechanical efficiency, a consideration of such important items as noise, method of control, frequency of oiling and any other factors that might enter into the use of the fan on a given job. Although indefinite, it is nevertheless real and, while there is no accepted standard by which it may be measured, it is quite necessary for the thorough and careful heating man to set up some arbitrary standard of his own to aid him in passing judgment on the suitability of a given fan for a given job.

Portland, Oreg., Heating and Ventilating Association Using Cooperative Advertising

Leonine strength in the cooperation of representative warm air heating and sheet metal specialists of a Northwest city and in safeguarding the health and comfort of the home is epitomized in a lion that stamps the unusual co-operative advertising of these alert members of the live Portland, Ore., Warm Air Heating and Ventilating Association.

Through the lion as a symbol the members of the Portland Warm Air Heating and Ventilating Association, with a membership composed of furnace and supply companies, sheet metal, stove, heating and engineering companies, representative of the industry in this leading city of Oregon, are indelibly stamping the idea of safeguarding the health and welfare of the home, and assisting to stabilize the warm air heating industry before the real advent of Autumn.

The association's membership through its various elements seized time by the forelock with its campaign starting in the late summer, so that early August days found the spectacular advertising well under way, with the circulation of proper heating and ventilating flowing into the homes as the circulation of money was once more released.

All the members of the association whose names were listed contributed to the success of the campaign, and share in the benefits which will be derived from the advertising that plays no favorites but advances the warm air heating industry as a whole.

Thus a dominant, unified, note is struck that is making a deep impression this Fall on the Portland public as they survey their heating plants and check their efficiency for operating through the long, hard Winter which everyone is predicting this year.

YES, IT'S A LION
But We're Not Lyin'
When we tell you---
There is no one thing that has a greater bearing on the health and welfare of your family than proper heating and ventilating of your home.
We're not lyin' when we tell you any good reputable physician will tell you that your children are much more susceptible to contagious diseases, such as measles, mumps, chicken pox, etc., if their vitality is lowered through breathing impure air. Living in a home with uneven heating causes colds which lower the resistance to other more serious ailments.
We're not lyin' when we tell you proper heating and ventilating means that there is a CIRCULATION of pure, warm air to every room of your home.
We're not lyin' when we tell you it is the business of the members of the Portland Warm Air Heating and Ventilating association to KNOW what is necessary to properly heat and ventilate your home. Call them now. Let them make a survey of your plant and tell you what is necessary to make it efficient.
Call any member of the association. That is your guarantee of satisfactory service.
Portland Warm Air Heating & Ventilating Association
J. C. BAYER FURNACE CO. 204 Market Street
BYRNE FURNACE CO. 338 Russell Street
EXCELSIOR FURNACE SUPPLY CO., 130 Thompson St.
KELLY BROTHERS 172 East 34th St.
LLENAIR FURNACE CO. 1401 Sandy Blvd.
LENNOX FURNACE CO. 705 East 16th North
LEVIN FURNACE CO. 304 East 7th St.
LYNCH BROTHERS 411 East Stark St.
McPHERSON FURNACE & SUPPLY CO., 441 North 19th St.
MONTAG SALES 62 Sixth St.
BEN MORRIS SHEET METAL WORKS, 857 Union Ave. N.
NORTHWEST STOVE WORKS 781 Gladstone Ave.
SANDBERG SHEET METAL WORKS, 120 West Lombard
SIMPSON HEATING CO. 944 Mississippi Ave.
STARK-DAVIS COMPANY 188 Fourth St.
VOLUME HEATING & ENGINEERING CO., 1002 Fessenden
I. T. WOODRUFF FURNACE CO. 281 Hawthorne

A FORCED WARM AIR CHURCH HEATING SYSTEM

THERE is one type of heating job which the warm air heating contractor always finds interesting. That job is the church installation. One reason for this interest is because these jobs usually can be done at a substantial profit. Another reason is because each such job is different from all others and the right solution to the problems presented make the heating man feel he is something of an engineer after all.

One of the most interesting features of any church heating project is the problem of introducing the warm air and taking out the cold air so that there is no drafts and so that the back of the auditorium is just as warm as the front and that if there is a gallery those sitting there won't be smothered while those on the main floor are freezing.

Here are the details of a church heating project which was worked out satisfactorily. The system employed is simple in the extreme and proved a truly economical installation. The plant has been under test for one winter and proved successful.

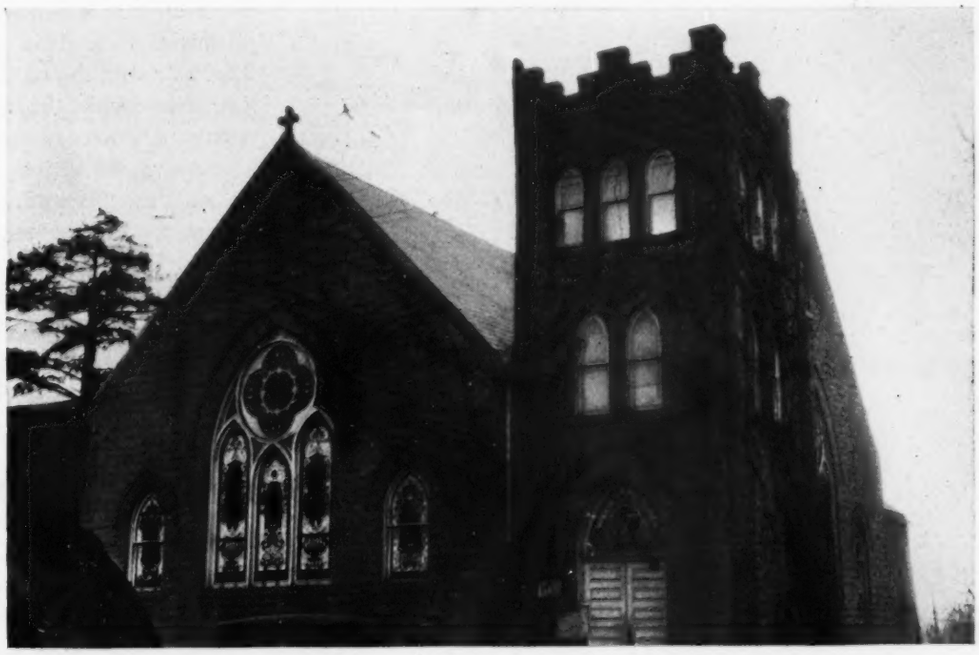
The job was done by Cash Lawrence of Wabash, Indiana. He is the Majestic Furnace company's dealer and one of the best known heating men in his part of the state. The church is the Wabash Avenue, M. E. Church in Wabash.

The church building is a heavy stone structure with a basement used for class rooms and for entertaining and serving and a main floor auditorium without any balcony. Like all churches there are large windows in some of the walls and a high ceiling which makes a dead air blanket extremely likely unless air movement is assured.

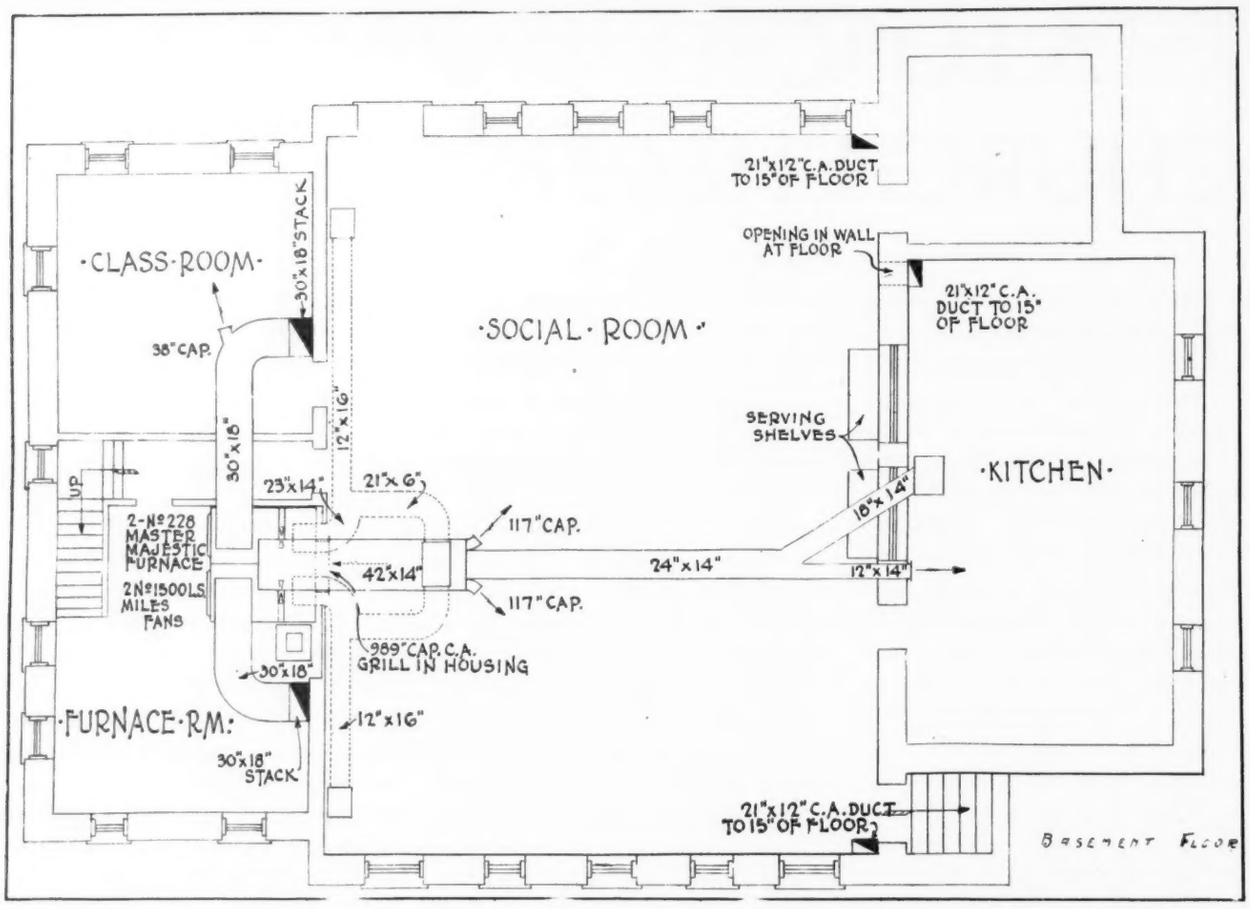
The heart of the system is a twin furnace plant using two number 228 Majestic furnaces housed in one square casing. These furnaces burn coal. The other important part of the system is a pair of number 1500 LS Miles fans housed together.

There are two distinct parts to the heating problem. The first part deals with the heating of the basement. This basement floor is on all one level, so that the furnaces are just as high as the floor of the class room. This makes a warm air plant using a fan the most satisfactory installation.

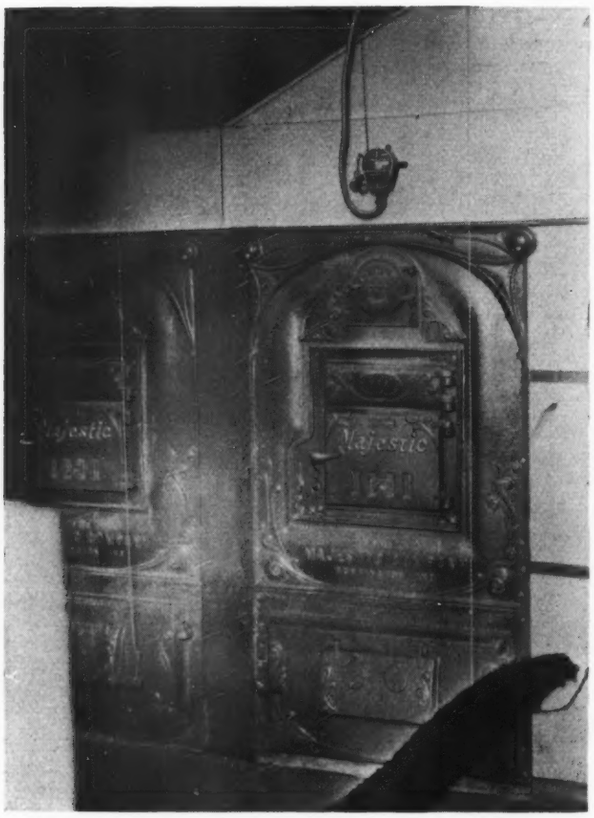
One trunk line duct is used to heat the basement. This trunk comes off the top of the furnace and passes through the furnace room wall and runs along the ceiling of the class room, then through the wall between the class room and kitchen where one outlet discharges into the kitchen and a branch heats



The church is a load bearing walled stone structure with large windows on two sides. The basement is used for many social activities and had to be heated



The basement layout shows the small amount of duct work used to heat the large building. Special Attention to the return air movement eliminated considerable duct work. One long trunk and two larger but shorter trunks complete the system



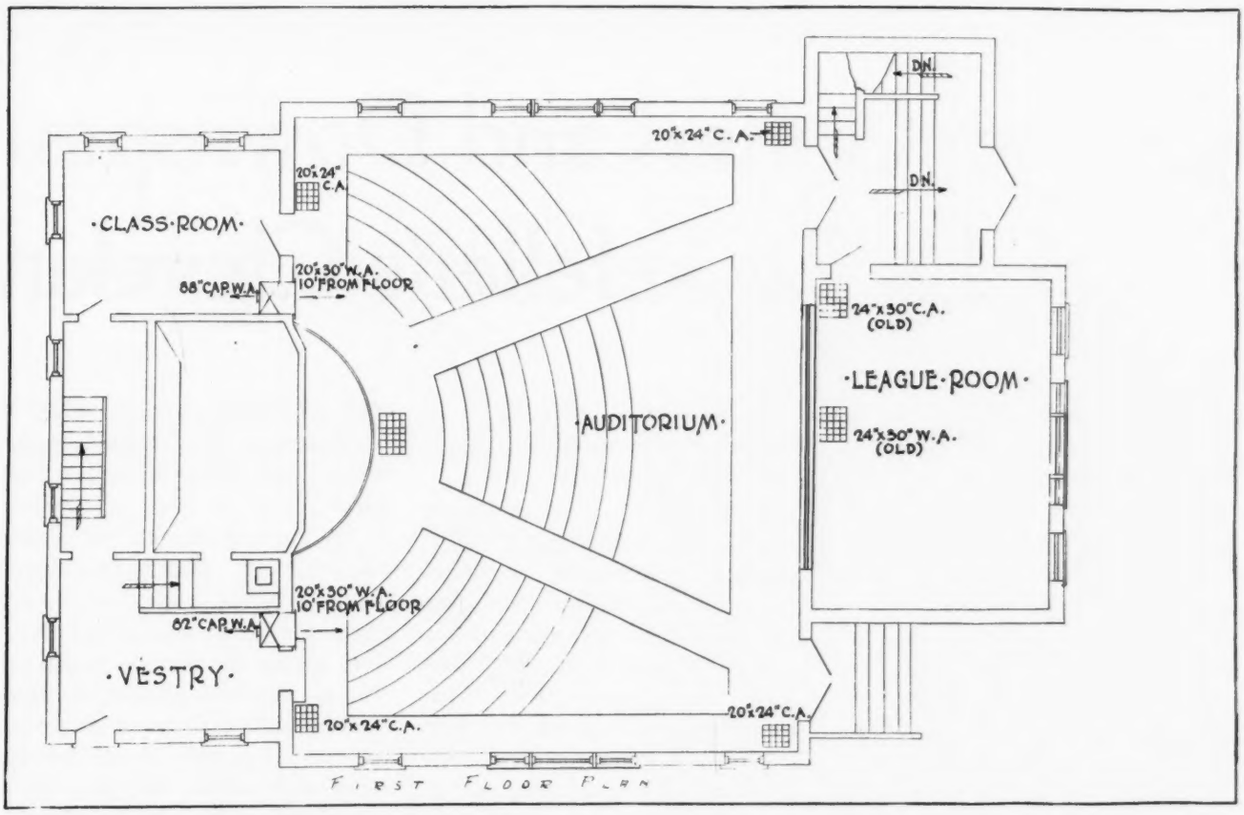
The two coal-burning furnaces are housed in a single square casing. The dampers are controlled by a first floor thermostat. The fans are controlled by the bonnet temperature regulator shown

the league room on the auditorium floor.

As it comes off the furnace this main duct is 42 inches wide and 14 inches deep. This depth was all allowable with the ceiling height. A few feet inside the furnace-social room partition two stub outlets working at 45 degree angles from the duct are taken off. These direct warm air throughout the social room. This warming of the large room is aided by the return air system.

As can be seen on the plan a return air grille is placed in the outside wall of the fan housing and cut through the furnace room social room partition at floor level. The warm air is blown outward from the outlets, travels to the outside walls and pulled back by the fan.

The kitchen is heated by the one outlet mentioned. No direct return air passage is provided, but a grilled opening is cut in the partition be-



Most of the registers and grilles are of the floor type. These are all placed out of the way, some in corners and the others in the elevation of the stage. The air movement is out from the stage and down to the floor, through the floor and back to the fans

tween kitchen and social room. As there two doors opening between the kitchen and social rooms the contractor felt that air movement out of the kitchen would be assured. This has proved true.

According to good figuring there are 155 square feet of glass area and 1729 square feet of floor area and a cubical contents of 16,330 in the social room. The B.t.u. loss of this room is—glass, 11,900; floor, 34,860; cubic, 22,820 and unusual exposure, 6958. The total is 76,538 B.t.u.'s. This amount of heat is furnished by the 234 square inches of warm air outlet from the duct.

The heat loss of the kitchen is—glass, 2450; floor, 12,390; cubics, 9380; unusual exposure 2422; total 26,662. This loss is balanced by the 12 by 14-inch duct to the kitchen.

The class room figures out like this: glass area, 38 square feet; floor area, 245 square feet; cubical contents, 2205. The heat loss from this is glass 2870; floor 4970; cubics, 3080; unusual exposure 1092; total 12,012.

The heating of the auditorium floor is interesting. One of the features is the use of old grilles and registers and the use of the minimum amount of duct work.

To understand the system used the two floor plans will have to be studied together. The stage juts out into the auditorium. It is, of course, raised and this elevation comes right over the furnace. The contractor took advantage of this and placed two large warm air grilles in the face of the stage elevation, discharging out into the auditorium.

The warm air for these two large registers is supplied by two 30 by 18-inch flat ducts off the top of the furnace. This is all the warm air openings provided for the auditorium. Circulation is furnished by the fans. Right in the center of the auditorium and up against the stage one large return air grille is placed in the floor. At the outside wings of the stage a floor return air grille

Dealer CASH LAWRENCE Address WABASH, IND Contractor SAME
Owner WABASH AVE. M.E. CHURCH Address SAME
Location of Building SAME Old or New OLD
What Is Building Used For CHURCH Construction
Figured By RTL Date Job No. Furnace Specified
CEILING HEIGHTS— BASEMENT 1st FLOOR 2nd FLOOR 3d FLOOR 4th FLOOR

ROOM	NO.	Glass sq. ft.	Wall sq. ft.	Ceiling sq. ft.	Floor sq. ft.	Cubical Contents	HEAT LOSSES IN B. T. U.'s OR INCHES Glass	Wall	Ceiling	Floor	Cubic	Add for Unusual Exposure	TOTAL Required	Pipe Area Used	Pipe Size Used
1st Floor Class	4	38	410	245		3185	2870	3440	6510		4410	2723	29953		
Vestry	5	46	377	210		2730	3500	1290	5530		3180	2520	27720		
Auditorium	6	400	1628	2028		43076	30000	53550	23900		60270	19852	218312		
League	7	192	627	612		6732	4700	26880	16240		9380	6097	67057		
						55725							343102		

This is a data sheet for the auditorium floor

torium. Circulation is furnished by the fans. Right in the center of the auditorium and up against the stage one large return air grille is placed in the floor. At the outside wings of the stage a floor return air grille

(Continued on page 41)

Copper Gutters and Downspouts J. D. Rockefeller's Cleveland

IT isn't often that the sheet metal contractor gets a job of guttering and downspouting which he can count on to run his shop for several weeks. In most cases these jobs are small in gross income and equally small in profit. It is when the contractor gets into a large real estate development that guttering assumes decent proportions. And here the contractor has to watch his step or his big job will cost him money.

This, however, is the story of a sheet metal shop which is right in the midst of a large job of copper gutter and downspout work. And the valleys also fall within their contract. The job is in Cleveland and the sheet metal firm is the Cleveland Metal Roofing and Ceiling Company, of which Frank Hiller is the active manager.

Years ago John D. Rockefeller had an estate outside Cleveland which he called Forest Hill. In those days the estate lay far outside the settled portion of the city.

Then for some years the estate lay idle, but the city spread until it touched and surrounded the old estate. The city opened a new street through the land and made it over into a wide arterial highway. The estate remained in the hands of the Rockefellers, who all this time had great plans in mind. John D. Rockefeller had long had a pet idea of laying out on this land a model community for young executives and their families. He wanted a model community with model homes and every convenience.

Last year, when so many craftsmen were out of work, he decided to begin construction of this community. Streets were cut through the land and along them scores of houses were laid out. These streets wind over the low hills of the estate and where there are no old trees new ones are being planted so that every home site will have several trees.

To start operations 47 houses were laid out. There are some nine or ten different types of houses and these are alternated up and down the streets so that no group of houses will look just alike. The houses are, however, laid out in pairs so that two houses of the same architecture, but with opposite floor plans, are brought together. An old-fashioned, double gate separates the houses and gives access to the garages and rear.

The houses vary in size and also in price. The price range is from approximately $15,000 to $50,000. One of the things insisted on is that the houses use every modern appliance and convenience and that only the very best materials and construction be employed.

The second floor dormer windows break the eave line into short sections. This necessitated short, closed end sections of gutter and downspouts down the center of the elevation. The gutters are of the hanging type and the downsports are plain round

Used in Development

Two flat elbows are required to keep the downspouts against the walls. The straps are severely plain, matching the downspouts

The general construction of the houses consists of a lower story of brick with a stained cedar second story with beam work and brick panels to follow the general type of the English cottage. The roofs are all of heavy slate, the slate coming together in a closed valley. The valley is waterproofed with zinc, which is laid according to the recommendations of the zinc institute. This calls for the use of small pieces of zinc. These pieces are extended about 2 inches beyond the top of the slate and nailed. This eliminates much of the nail penetration common to closed valley work.

All the gutters and downspouts on these houses are of copper. The gutters are 5-inch, single bead, round, hung below the eave line. Because of the architectural style of the houses, there are some places along the eaves where no gutter is employed. This is especially noticeable where the roofs come down to within one story of the ground.

The downspouts are all of copper and are all round and 3 inches in diameter. This small size was used since there are few long stretches of gutter and where a long stretch does occur two or more downspouts are provided to carry out the water. These downspouts are severely plain and the straps to support them are without ornamentation.

As can be seen in the pictures, the gutters are generally some inches away from the wall and the downspout employs one elbow to reach the second floor and a second elbow to reach the brick wall of the first story.

One of the interesting features of the houses is the second story windows. These are small dormers which break through the eave line and cut the gutter lines into many small sections. This required the use of downspouts to each section, there being as many as three downspouts on one face of the house. This also necessitated sealing of the ends of many small lengths of gutter and the use of many outlet tubes.

Work has been going on all summer and the contractor has had a force of men on the job most of the summer. Since all the plans were standardized the gutter lengths and the downspouting were fabricated in the shop. The sections of gutter and downspout were trucked to the job and hung as the roofers went along.

On some of the largest houses gutters are left off some parts of the house. Here, again, short gutter sections and numerous downspouts are provided

Three-Piece Transition Elbow

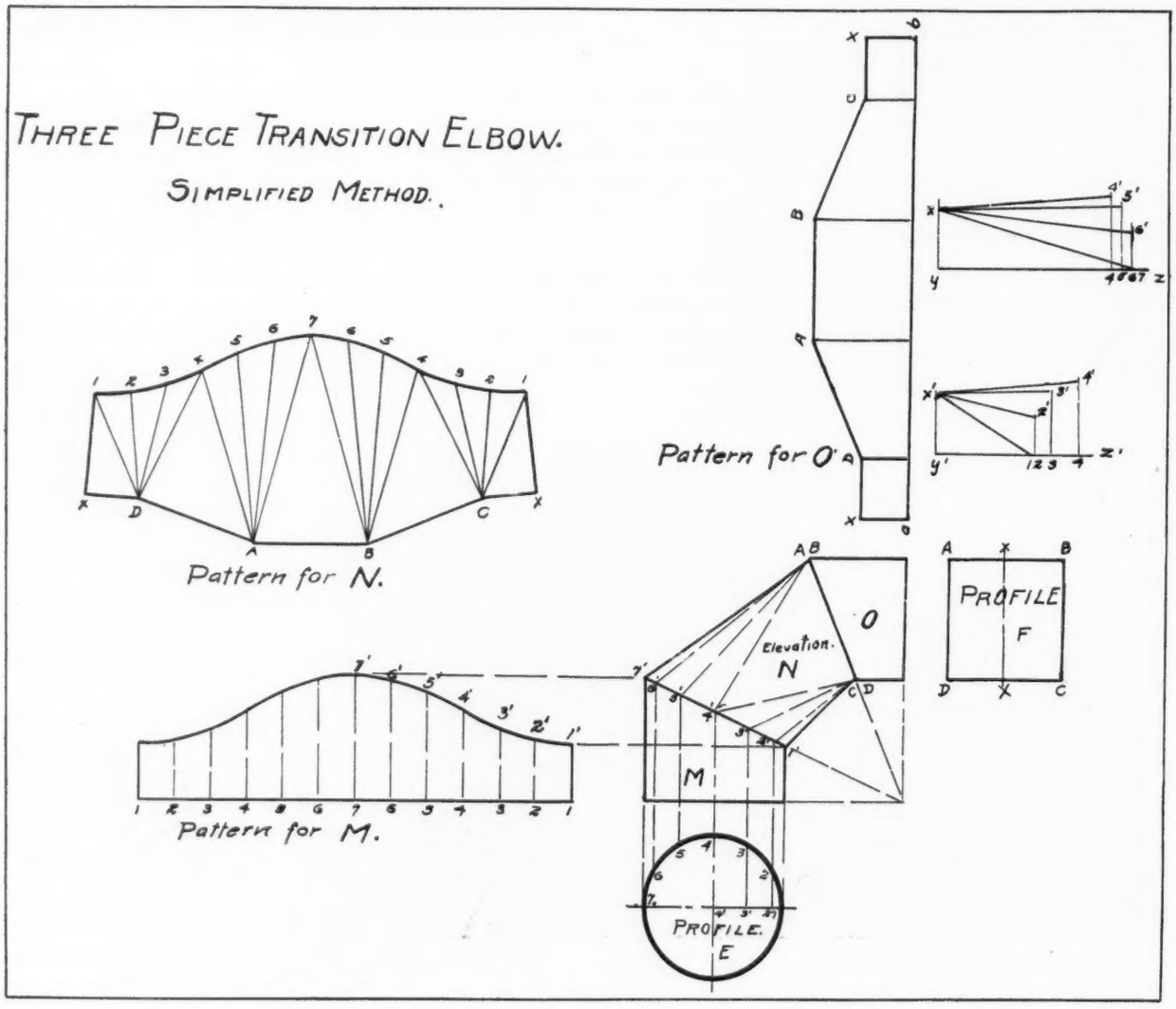
By **L. F. HYATT**
Contributing Editor

THE three piece transition elbow from round to square is a pattern often encountered in sheet metal work and the method used here is the simplified method. This method may be used in any three piece elbow the halves of which are symmetrical, regardless of the shape of the end pieces or the angle of the elbow. If the halves are symmetrical when viewed in plan a plan view is of course needed.

First draw the vertical and horizontal center lines and with the intersection of these two lines as a center draw the circle representing the round opening of the three piece elbow, profile E. Now draw the elevation and the square profile view, F, of the elbow as shown. Divide the profile E into twelve equal spaces and number 1, 2, 3, 4, etc. From each of the division points on the profile draw perpendicular lines intersecting the mitre line at 1′, 2′, 3′, 4′ and connect these points with the two points lettered A B and C D.

It is now necessary to obtain the true lengths of all foreshortened lines found on part N of the transition elbow. To obtain these, first draw the angle x y z. Take the distance A to x found on profile F, and step off this distance from point y on the vertical line x y. Take the distance A B to 7′ found on the elevation and step it off on the line y z, locating point 7. Draw a line connecting this point with point x. Next take the distance A B to 6′ and step it off as before on line y z, locating point 6. From this point on y z draw a perpendicular line of indefinite length and on this line step off the distance 2-2′ found on profile E, which is the same as the corresponding distance would be on the other half of the profile. Step this off on the vertical line just drawn locating point 6′ on angle x y z. Connect 6′ with x this giving the true length of the line. Continue in this manner with all of the lines of the group.

Next draw the angle x′ y′ z′ as



shown and on the vertical line step off the distance A-x found on the profile F, locating point x′. Take the distance C D to 4′ found on the elevation and step off this distance on line y′ z′. From this point draw a perpendicular line of indefinite length and upon this line step off the distance 4-4′ found on profile E, locating 4′ on angle x′ y′ z′. Connect this point with x′. Now take the distance C D to 3 and step it off from y′ on the line y′ z′. Again draw a perpendicular line of indefinite length and upon it measure the distance 3-3′ found on profile E, locating point 3′ on triangle x′ y′ z′, and connect this point with x′. Continue in this manner up to and including C D to 1. The seam line is of course found in its true length from C D to 1 on the elevation view. This completes the two diagrams of true length lines. We may now proceed with the development of the patterns.

Draw the stretchout line for pattern M and step off twelve spaces equal to any one of the spaces found on profile E. At each point on this line draw perpendicular lines of indefinite length. Next draw horizontal lines from points 1′, 2′, 3′, 4′ etc., found on the elevation, intersecting the vertical lines of like number. Lines from 1′ to 7′ are the only ones shown in the drawing. Through these points draw the curved line describing the top of pattern M.

Next draw the perpendicular line a-b for pattern for O. On this line step off the spaces x-D, A-B, C-x found on profile F. From each of these points draw horizontal lines of indefinite length, and from points A B and C D on the elevation draw lines parallel with the line a-b intersecting the horizontal lines just drawn and locating the points x, D, A, B, C and x as shown. Connect these points of intersection, completing the pattern for O.

The pattern for part N of the elbow is now made. First draw the horizontal line A-B equal in length to A-B found on profile F and from the angle x y z take the distance x-7, which is the true length of 7′ to A B, and with A and B as centers strike arcs intersecting each other locating point 7 on the pattern for N. Next take the distance x-6′ on the same diagram of lines and with A and B as centers again strike arcs of indefinite length. Now from pattern M take the distance 7′-6′ as a radius and point 7 on pattern N as a center and strike arcs intersecting the arcs just drawn, locating points 6. Take the distance x-5′ found on angle x y z and with A and B as centers again strike arcs of indefinite length. Now take the distance 6′-5′ found on pattern M and with 6 as centers strike arcs locating points 5 on the pattern. Next from the group of short lines on angle x′ y′ z′ take the distance x′ to 4′, which represents the true length of line C D to 4′ on the elevation, and with 4 on pattern N as a center strike an arc and then from pattern for O take the distance A-D as a radius and with A and B as centers strike arcs intersecting the arcs just drawn locating points C and D. Now with C and D as centers and the distance x′ to 3′ on angle x′ y′ z′ as a radius, strike arcs. Take the distance 4′ to 3′ found on pattern for M, and with 4 on pattern for N as a center strike arc intersecting the arc just drawn, locating point 3 of pattern N. Continue with the remaining lines as before.

Now with C D-1′ found on the elevation as a radius, and 1 on the pattern as a center strike an arc, and with C and D on the pattern as centers, and the distance x to D found on profile F as a radius strike arcs intersecting the arc just drawn locating points x on the pattern. This completes the last triangle of part D of the elbow. Additions are now made for the seams and laps, thus completing the pattern.

OVERHEAD

(Continued from page 29)

loading overhead, another uses a second and the third uses material and labor, it depends upon the ratio of material to labor as to which one gets the job. If material predominates, the shop loading overhead on labor gets it. If material and labor are approximately equal the shop loading on the total of labor and material will get it—assuming, of course, that their basic figures for material and labor are approximately the same, and also that their overhead percentages are approximately the same, and also that their overhead percentages are approximately the same.

It is my contention that overhead applies with equal force to material as to labor; that loading overhead on prime cost (material and labor) is more accurate; and that, in the end, you will have more satisfied customers—more business—and more profit.

CHURCH HEATING

(Continued from page 37)

is placed up against the stage. These three grilles are all connected into a two-way duct system suspended from the ceiling of the basement social room. On the plans this duct shows as an interesting layout. The large center grille discharges both right and left and the two smaller outside grilles come together over the fan housing.

The return air system for the auditorium and the warm air duct to the basement kitchen and the large ducts to the stage registers constitute all the duct work required. But this compact system does not furnish all the heating scheme designed.

In the two outside corners of the auditorium there is a floor grille. This drops through the floor through a 21 by 12-inch cold air duct to a point about 15 inches off the social room floor. From the open end the cold air drops to the

(Continued on page 48)

GRAVITY EXHAUST VENTILATION

Dampers and Dampering

By **PAUL R. JORDAN***

I PRESUME that what is referred to in the questions on dampers is the ventilator damper and not the back draft damper. At any rate, it will be ventilator dampers that we will talk about.

The best type of damper, to my notion, is the single leaf damper because it is simple, easy to make properly, low in cost, dependable in operation and cuts off the flow of air more nearly completely than any other type. The other types are the double leaf damper and the louvre damper. They are more complicated, more expensive and on account of the number of joints are more leaky.

The only objection to the single leaf damper is that it is sometimes necessary to put a longer stem on the ventilator base in order to give the damper room to swing.

As to where a damper should always be used I would say that they are a mighty good thing to have on most jobs. They certainly should be used on gravity systems having a number of flues. Dampers installed in each individual flue will give the owner control of the ventilators which he cannot get in any other way.

I do not say that dampers should always be used. A damper at its very best offers a certain obstruction to the flow of air. Furthermore it gives the owner something to play with, something to forget and leave closed or open to furnish him interference which he does not know about and blames the system for unsatisfactory operation. However, on most jobs the advantages of control are greater than the disadvantage of misuse, and the amount of obstruction furnished by a properly designed single leaf damper is relatively small.

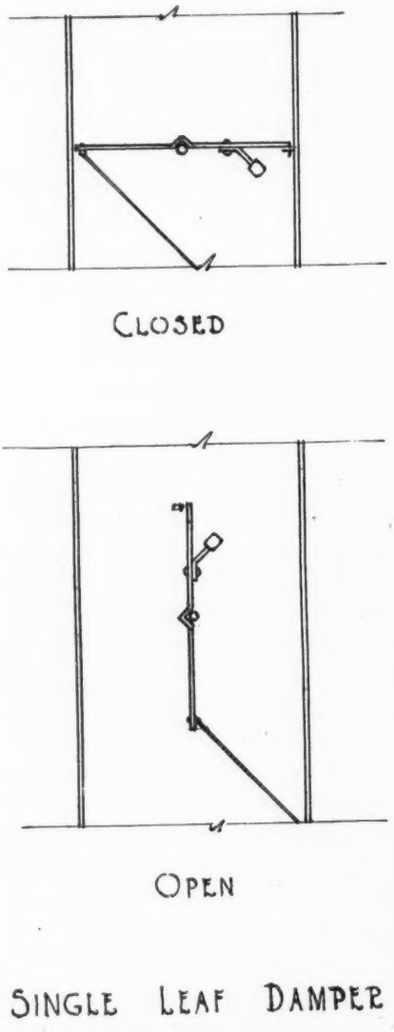


Figure 1—This is the plain, single leaf damper open and closed. Note how the operating chain is hung to the right so that it is not on "dead center" when the damper is open. The weight closes the damper whenever the chain is loose

As to where a damper should be installed, much depends on the individual job. I have already stated that on a multiple flue job a damper in each flue is a good thing. Where there are several openings into a common attic or roof space it is advisable to put an individual damper in each ventilator even though the flues be dampered. If, for instance, all of the flue dampers are closed and there are two or more ventilators opening into the attic, there would be a tendency for the stronger ventilators to suck outside air down flues and weaker ventilators. Ventilators may all be alike, but some will be stronger than others on account of installation features. A back draft of this nature may not do any harm, but at best it will increase the heat loss through the attic floor.

Dampers should be installed below the working parts of the ventilator. In the case of the stationary ventilator, the damper should be installed far enough down so that when it is open no part of it will come up within the active portion of the ventilator, which may be usually described as that part above the top of the ventilator neck.

In a rotary ventilator, the damper should not be installed in the movable hood. It should be installed in the ventilator neck, or better still in the ventilator base. Dampers should not be installed in the movable hood, first, because on account of the mechinacl difficulties it may cause interference with the rotating operation of the ventilator; second,

Paul R. Jordan and Company, Indianapolis, Indiana

In the September 27 issue we listed some questions on dampers and dampering which had been submitted to us. This article takes up those questions and answers them. The article also gives some important pointers on operation and installation of dampers.

If there are any further questions on this matter of damper installation and operation, Mr. Jordan will be glad to answer them. Write him care of American Artisan.

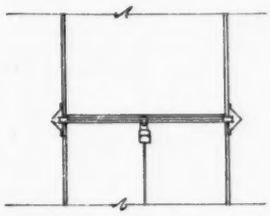
because a damper in the hood does not close up the opening between the ventilator neck and the ventilator hood which is bound to be a source of air leakage.

I learned this last from a practical sheet metal contractor, J. R. Everroad of Columbus, Indiana. I was making tests of two different types of dampers, one of them installed in the ventilator hood and the other installed in the ventilator base. The damper in the base was a single leaf type and had entirely too much clearance. In spite of this I found that it was not leaking as much air as the damper in the hood was when both dampers were closed. I was unable to account for this fact until Everroad called my attention to the unclosed apertures between the ventilator neck and the ventilator hood. This aperture was shut off by the damper in the base but was not shut off by the damper in the hood, the damper being entirely above the aperture in the latter case.

As to how dampers should be installed: I believe I had better take up practical damper construction along with installation. The sketches will help us on this. Figure number one shows a plain, single leaf damper in two positions, open and closed. This damper is swung on a round, steel rod placed in a brake across the center of the damper. Stops are riveted or bolted on the sides of the flue at the proper places.

I want you to note two things about this damper. First the operating chain is so swung as to pull to the right so that the damper can be swung entirely open. If the pull is straight down the damper cannot be entirely open. Second, the balancing weight is dropped over to the right so that when the damper is open full, the damper will not be on a dead center. This is important.

You will note that the damper is made positive closing. In other words, if the chain is released the damper closes. You have to pull the chain and fasten it to keep it open.



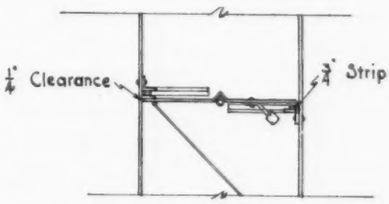
SINGLE LEAF DAMPER SHOWING COVERING AND CONES

Figure 2—This illustrates a "kink" in the form of small metal cones over the ends of the damper rod. These keep out the weather and keep the damper swinging freely

By putting a fusible link where the chain is fastened to the damper, a regulation fire protection arrangement is complete, as the damper when released by the parting of the fusible link will automatically close itself.

In the larger dampers a piece of angle iron may be inserted or bolted across the damper at right angles to the brake. So much for drawing number one.

Figure number two shows the sheet metal cones which cover the ends of the damper rod, making the damper weatherproof. Without these, some kind of complicated bearing would be necessary or else the rain would blow in at the holes. With these cones, it is only necessary to drill holes in the flues to run the damper rods through; the holes themselves furnish a very satisfactory bearing provided the cones are put on to keep the weather out.



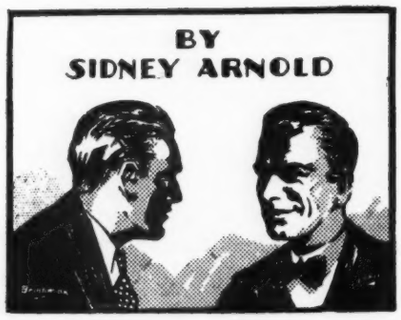
SINGLE LEAF DAMPER SHOWING FELT STRIPS

Figure 3—Wherever heat conservation is required, a felt-lined damper may be desirable. Two metal strips are riveted to the neck and lined with felt. One strip is above the damper and the other below

Figure number three shows a felt lined damper. For ordinary jobs there will not be enough leakage around the damper made up plain to do any damage. However, in some cases, particularly where heat conservation is necessary at certain times, it is desirable to have an air tight job. In this case a circular damper strip can be formed on a crimper. This strip must be made in two halves, one half to be installed below the damper for it to hit down upon, and the other half to be installed above the damper for it to hit up against. Felt of course can be fastened to these strips very easily.

Most ventilator manufacturers are prepared to furnish any type of damper their clients need. In estimating a ventilator installation it is desirable to include dampers where necessary and to provide the type of dampers best adapated to the situation, and to install in the location where it will be most effective.

RANDOM NOTES AND SKETCHES



Fred R. Bishop, the new manager of the furnace blower department of the Brundage Company, breezed into our midst the other day all pepped up about the progress the warm air heating game is showing.

Fred is the past president of the Michigan Travelers Auxiliary and one of those chaps who keep young by dispensing sparkling enthusiasm.

* * *

Don't Take This Seriously

The local committee devoted to the furtherance of sweetness, light and progress in Bingville had called on Ed Tobin who put a tin roof on the first brick house, aged one hundred and two, in an attempt to learn to what he owed his longevity.

"Fer one thing," he chirped, "I might say that I ain't never smoked or cussed or took a drink in my life."

"Ah!" breathed the zealous citizens, and proceeded to make notes.

Just then a tremendous racket broke forth on the floor above. There was the sound of overturning chairs, of breaking dishes and smashing furniture.

"Ah, gosh!" Tobin moaned. "There's grandpop home, an' drunk again!"

* * *

My friend, Joe Weiss of the Interstate Machinery Company, Chicago, has just returned from an extended vacation in California, Colorado and Utah. He was gone so long that he just had to mix some business with this pleasure even if it was his first vacation in five years.

Joe says he called on a number of machinery manufacturers, jobbers and sheet metal shops out west and got acquainted with some new sheet metal machinery items which he plans to introduce to the trade.

Bad Company

Wife: "How did you get into this state?"

Hubby: "Bad company, m'dear."

Wife: "What do you mean by bad company?"

Hubby: "Well, there was five of us to one bottle of whiskey, and the other four were teetotallers."

* * *

Wm. R. Neal who operates the Sheet Metal and Welding Works at Jacksonville, Florida, must be president of the local Optimist Club as well as a steady visitor to the Fountain of Youth.

Two year and three year subscriptions to the ARTISAN are common everyday affairs in the circulation department but Mr. Neal who has read this journal for many years writes to tell us that he wants to sign up for a ten year period

And that's not a hint boys because the fact of the matter is that we have never had such a request before and to be real truthful don't know what to do about it. We will have to give this some study.

* * *

Form in Line, Please!

Dumb: "We're going to give the bride a shower."

Dumber: "Count me in. I'll bring the soap."

One of our visitors this week, and whose visit was a really pleasant surprise, was our good friend, Ed Wolaver of Cleveland, who is closely affiliated with the advertising and sales policies of the Henry Furnace and Foundry Company.

* * *

Ain't It The Truth?

He was a stranger in town and he stuttered badly. For some time, slightly embarrassed by his affliction, he refrained from accosting the inhabitants, but at last he had to succumb. Incidentally, he was a large gentleman with forbidding biceps. He tackled a passerby.

"P-p-p-pardon m-m-me," he said, b-b-b-ut how do you g-g-get to the C-c-c-commercial hotel?"

The other eyed his bulging shoulders apprehensively, but finally made reply:

"Out of a c-c-c-city of t-t-two hundred thousand p-p-people you have to p-p-pick on m-m-mme."

* * *

Another visitor to our offices the past week was Ray G. Swisher. Ray, you know is a popular hard working furnace salesman. I certainly enjoy these visits from the boys out on the firing line. They always have interesting and worthwhile business topics to talk about.

* * *

How Silly!

A woman arriving in this country after a short visit to the continent was asked the usual question by the customs official at the landing port —"Anything to declare, madam?"

"No," she replied, sweetly, "nothing."

"Then, madam," said the official, "am I to take it that the fur tail I see hanging down under your coat is your own?"

"Heat Hustler" Fan

From Church Brothers Heating Company, Battle Creek, Michigan.

Can you give me the name and address of the manufacturers of the small fan which forces the air through a single warm air pipe?

Ans.—"Heat Hustler" made by The American Foundry and Furnace Company, Bloomington, Illinois.

Canvas

From George R. Baker, Alpena, Michigan.

Where can I secure 8-ounce canvas of good quality to be used as deck covering?

Ans.—George B. Carpenter and Company, 440 North Wells Street; J. W. Johnson Company, 1237 Macedonia Street; The Lehon Company, 44th to 45th Street on Oakley Avenue; Powers and Company, 3615 Arthington Street; all of Chicago, Illinois.

Repairs for "Pyramid" Furnace

From George Cochlin, Blooming Prairie, Minnesota.

Where can I secure repairs for the 1910 "Pyramid" furnace?

Ans.—The Forest City-Walworth Run Foundries Company, 2500 West 27th Street, Cleveland, Ohio.

Repairs for "American Beauty" Fireplace

From Walter A. Sargent, Pekin, Illinois.

Please tell me where to get repairs for the "American Beauty" fireplace No. 342, made by Dawson Brothers.

Ans.—Dawson Brothers are out of business, but William H. Hoops and Company, 529 South Wabash Avenue, Chicago, can duplicate parts.

Oil Heating Circulators

From the Cincinnati Stamping Company, Cincinnati, Ohio.

Kindly give us the names of manufacturers of oil heating circulators.

Ans.—Motor Wheel Corporation, Heater Division, Lansing, Michigan; Quaker Manufacturing Company, 215 North Michigan Avenue, Chicago, Illinois; Perfection Stove Company, Oil Heater Division, 7609 Platt Avenue, Cleveland, Ohio, and Williams Oil-O-Matic, Bloomington, Illinois.

Machines for Making Casing Rings

From C. Ed Smith Hardware Company, 314-316 East Washington Street, New Castle, Pennsylvania.

Who handles machines for making casing rings?

Ans.—Interstate Machinery Company, 601 West Monroe Street, Chicago, Illinois.

Fire Brick Cement

From E. C. Stocker, Columbia, South Carolina.

Who makes fire brick cement for heating plants using oil burners where fire brick is used?

Ans.—Chicago Fire Brick Company, 1461 Elston Avenue, Chicago, Illinois; Wm. Connors Paint Manufacturing Company, Troy, New York; Johns-Manville Corporation, 292 Madison Avenue, New York City; Sall Mountain Company, 176 West Adams Street, Chicago, Illinois; Clinton Metallic Paint Company, Clinton, New York; Pecora Paint Company, Fourth and Erie Streets, Philadelphia, Pennsylvania; Armstrong Company, South and Post Streets, Detroit, Michigan; Lastik Products Corporation, Oliver Building, Pittsburgh, Pennsylvania; Rutland Fire Clay Company, Rutland, Vermont.

Grain Tanks

From Waco Sheet Metal Works, Waco, Texas.

Please tell us who makes grain tanks of 20 gauge galvanized iron?

Ans.—Chicago Metal Manufacturing Company, 3724 South Rockwell Street, Chicago, Illinois.

Address of Security Stove and Manufacturing Company

From Brouillet Sheet Metal Works, Dubuque, Iowa.

Can you give us the address of the furnace manufacturers known as the Security Stove and Mfg. Co.?

Ans.—17th and Oakland Streets, Kansas City, Missouri.

"Hyro" Damper Quadrants

From Harry A. Ackerman, Chicago.

Where in Chicago can I buy "Hyro" damper quadrants?

Ans.—Chicago Furnace Supply Company, 1278 Clybourn Avenue, and Carr Supply Company, 414 North Dearborn Street.

"Woodmanse" Windmills

From Fessler's Tin and Plumbing Shop, Huntsville, Texas.

I should like to know who makes the "Woodmanse" windmill.

Ans.—Woodmanse Manufacturing Company, Freeport, Illinois.

Oil Garage Heaters

From Waldburger Brothers, Merrill, Wisconsin.

Who makes oil heaters for garages?

Ans.—Quaker Manufacturing Company, 215 North Michigan Avenue, Chicago, and Williams Oil-O-Matic, Bloomington, Illinois.

Gas Burner for Furnaces

From A. T. Dingledein, Springfield, Ohio.

Kindly inform me who makes gas burners for warm air furnaces.

Ans.—The Barber Gas Burner Company, 3702 Superior Avenue, Cleveland, Ohio; Columbia Burner Company, 1645 Dorr Street, Toledo, Ohio; Franklin Gas Burner Company, 821 East 8th Street, Cincinnati, Ohio; Langenberg Manufacturing Company, 4525 North Euclid Avenue, St. Louis, Missouri; Munkel-Rippel Heating Company, 4th Street at Goodale, Columbus, Ohio (gas attachment); XXth Century Heating and Ventilating Company, Akron, Ohio; Wonder Worker Gas Appliance Company, 59 Main Street, Cincinnati, Ohio, and Standard Heating and Radiator Company, 220 Penn Avenue, Pittsburgh, Pennsylvania.

NEW ITEMS *and* NEWS ITEMS
From and about the Manufacturers and Jobbers

American Brass Co. Issues New Catalog Describing Everdur Metal

The American Brass Company, 25 Broadway, New York City, recently issued a booklet describing their new product, Everdur Metal.

Everdur Metal is listed as a moderately priced Anaconda Alloy composed chiefly of copper, yet combining the strength, workability, and welding properties of steel with corrosion-resistance exceeding that of copper and copper-zinc alloys.

The catalog is interestingly illustrated with tests and their outcome made on pipes and bolts of Everdur Metal.

The last part of this catalog contains tables showing the results of physical tests of Everdur, and tables of weights of Everdur plates, sheets, and wire.

This catalog is available to any reader who wishes to write the company for it.

Inland Steel Company Opens New Merchant Bar Mill at Indiana Harbor

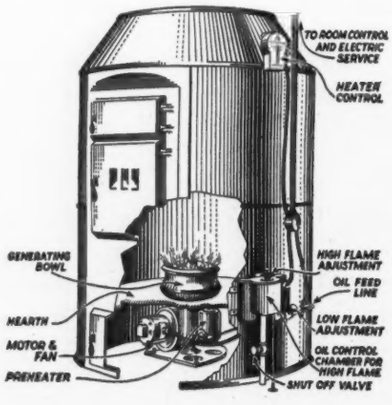
The Inland Steel Company's new merchant bar mill, which has been under construction for more than a year at the Indiana Harbor Works, is now completed and ready for operations. This is Inland's third bar mill at this plant, and it rounds out and completes the bar service Inland renders to buyers of steel in the Central West. Finishing on 10-inch rolls, this mill is equipped to produce the smaller sizes of rounds, flats, squares and shapes, as well as bands down to No. 12 gage and coiled material. The new mill has been designed and constructed in accordance with the most advanced principles of modern engineering.

Remington-Keystone Mfg. Co. Marketing High-Low Flame Oil Burner for Furnace

The Remington-Keystone Manufacturing Company of Ridley Park, Pennsylvania, is now establishing distributing agencies for their new high-low flame oil burner.

This new burner, the manufacturers claim, is especially well adapted to the warm air furnace. The reason for this is that there is always a flame within the fire pot to keep the castings or the refractory material hot enough to keep the air circulation moving through the furnace.

The B-1 Remington is very simple in construction. There is but



one moving part—a fan which operates only when the room thermo-switch calls for more heat. It operates only 20 per cent of the time. There are no gas or electric pilots, drip cups, cams nor gears. The oil flows from the tank through the oil control chamber to the generating bowl. Therefore there are no pumps nor accessories required to pump oil from the tank nor to inject it into the burning chamber through a nozzle.

The B-1 Remington is automatic in operation. Operates on high and low flame. As there is no gas or electric pilot and no pump to inject the oil, there can be no flare-backs or puffs to create smoke.

As oil is not injected under pressure, there is no flame noise. The fan, the only moving part, is slow speed and operating only a part of the time, it is practically noiseless.

The Remington burner makes possible clear floor space. The burner is tucked away in the ash pit. The control chamber is clamped to the side of the casing.

No electric or gas pilots nor oil injecting pumps are employed, the only gas or electricity required is the current needed to drive the fan at times when greater heat is required.

The manufacturers say that trouble with soot is not experienced since the high flame is never turned on while the furnace is cold.

The burner is sold for $200 list and a very profitable discount is given dealers. In the Philadelphia market the burner, room and bonnet control and one 275 gallon tank are being sold for $295 installed. The company sells on an eighteen month time payment plan.

Hart and Cooley Co. Mailing Out Giant Broadsides on Products

The Hart and Cooley Manufacturing Company, Chicago, for several weeks has been mailing out a large size, three color, broadside showing their line of registers and faces and also some of their other furnace accessories.

The broadside is not a catalogue, but is a sales stimulant illustrating the most important items in the company's extensive line.

Any reader wishing to see this striking piece of literature can do so by requesting a copy from the company.

"We are using more COPPER for Sheet Metal Work every year"

says F. C. Murphy:

"We have been in the sheet metal business forty years and have always aimed to do nothing but first-class work. We are using more copper for sheet metal work every year. A large part of our business is done through the Architect and General Contractor, who see the advantages in using copper for sheet metal work. We like to use Anaconda Copper because we find the sheets are level and true to gauge, and give good satisfaction."

MURPHY BROS. of Erie, Pa., had an interesting job recently. As part of the remodelling of St. Joseph's Church, it was necessary to install new gutters, because of a change in design. The original gutters, installed 45 years ago, were made of copper, rolled by The American Brass Company. Examination revealed that the copper was still in perfect condition, good for many more years of service.

The trend toward copper sheet metal work presents an opportunity for contractors to increase their business by standardizing on the best known brand. Customers know that Anaconda Copper correctly installed never fails to give satisfactory service. The American Brass Company, General Offices, Waterbury, Connecticut.

F. C. Murphy in front of Murphy Brothers' shop. They find that their Anaconda shop sign is an aid to business.

St. Joseph's Church, Erie, Pa., recently equipped by Murphy Brothers with Anaconda Copper gutters.

ANACONDA
from mine to consumer

Sheet Metal Work of

ANACONDA COPPER

Look for the name ANACONDA in every sheet and strip. Leading supply houses carry it.

Mention AMERICAN ARTISAN in your reply—Thank you!

Armco Beats Fisher Body 2 to 1 in Fast Ball Game

Armco, representing the heating and sheet metal industry playing against Fisher Body Company, Cleveland, team, scored a hard won victory by a score of 2 to 1.

The home and home series of games between the Fisher Body Company of Cleveland and The American Rolling Mill Company of

Middletown is more than just two ball games between rival clubs. These games are one of those rare occasions when teams representing customer and manufacturer have met in an athletic contest. Why they haven't before no one knows. Athletic contests have long been recognized as a means of cementing friendships, bettering acquaintanceships and bringing about understanding. It works that way among individuals within an industry, so it seems logical that it should produce the same results between industries.

As stated in the opening para-

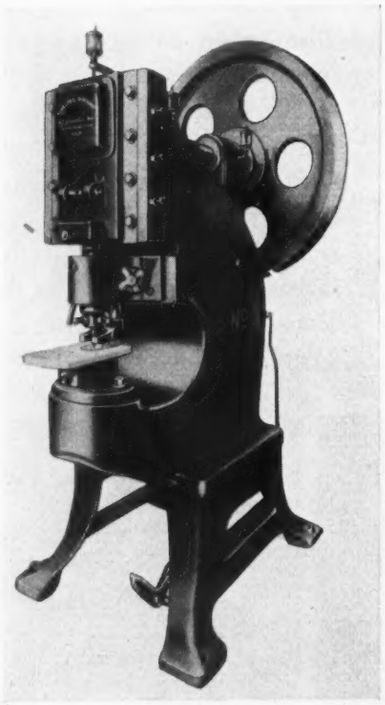
graph, Armco won the first game at Cleveland on Saturday, August 26. It was a contest featured by sensational plays which ended 2 to 1 in favor of the steelmakers. A representative crowd, which included a number of officials of both organizations, witnessed the game which was played at Fisher Body Park.

The second game will be played at Middletown on Armco Field, probably on Saturday, August 23

A. C. Campbell, Inc., Marketing a New and Larger Nibbling Machine

A new Campbell Nibbling Machine, the No. 3 for cutting all kinds of shapes from sheet metal 3/8 to 3/4 inches, has just been announced. The manufacturers claim the machine will cut original pieces and can be used for production work where it would not pay to make expensive punches and dies.

The Campbell No. 3 Nibbling Machine cuts fast in any direction —approximately 20 linear inches per minute. Like the smaller nibbling machines, it works on the cir-



cular punch and die principle with a pilot to prevent the work from slipping and the punch from taking too large bites. The cutting is clean without burr and very little finishing is required when an absolutely smooth edge is required.

The machine is built to handle a large variety of work. Circles can be accurately and easily cut with the circle cutting attachment furnished with the machine. For making original cuts the use of a straight edge and the French curve is recommended, as this insures close cutting to the line by even the inexperienced operator.

Mark J. Lacey to Manage Peck, Stow & Wilcox Sales

Mark J. Lacey has joined The Peck, Stow & Wilcox Company, Southington, Conn., and has been elected vice-president in charge of sales of that company. He was formerly with Landers, Frary & Clark, New Britain, Conn., and, previously, had been with the Corning Glass Works.

CHURCH HEATING

(Continued from page 41)

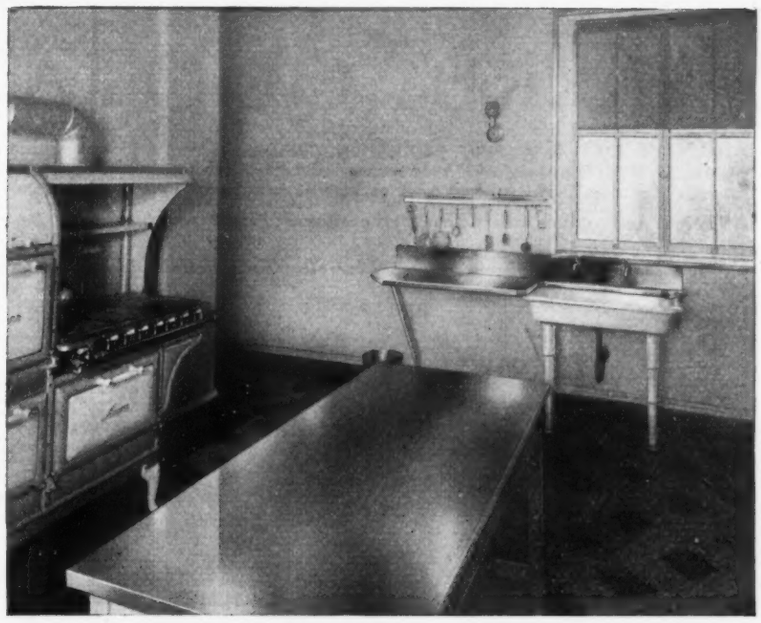
floor where it is picked up by the air moving to the return air grille for the social room.

The league room is heated from the branch taken off the basement kitchen duct. The warm air discharges through a floor register which was in place before the new system was installed.

In an inside corner of the league room a return air grille is cut through the floor. This connects into a drop duct which follows down along side the basement kitchen partition and then cuts through the partition to discharge into the social room again at floor level.

To supply sufficient warm air for this building 6.5 square feet of grate area were necessary. The twin installation provided has 7.08 square feet. To insure air change and heat all through the structure 3715 cubic feet of air per minute must be passed through the furnace casing. The twin fan has a capacity of 4400 cubic feet per minute or sufficient extras so that the fans do not have to operate at maximum capacity all the time.

The dampers of the two furnaces are hooked in conjunction with a thermostat so that when temperature falls the dampers open up. The fans are controlled by a bonnet temperature regulator which starts the fans when the temperature inside the casing is high enough and turns the fan off when the temperature drops to a point where the fans would be passing cold air into the rooms.



Monel Metal table top and all Monel Metal drain board installed in residence of Philip H. Haselton, West Orange, N. J. by JOHN DAUM of West Orange, New Jersey

Sheet Metal Contractors! MAKE MONEY

Modernize your customers' kitchens!

There are thousands of kitchens requiring the expenditure of only a few dollars to bring them up to date. A little paint, perhaps—and the installation of Monel Metal equipment are all that are needed. There's nothing like Monel Metal to make a kitchen look spick and span, bright, cheerful—MODERN.

A little effort on your part will bring you profitable Monel Metal jobs. Table tops, drain boards, shelving, kick plates, oven linings—these are only a few of the uses for Monel Metal in the modern kitchen.

Monel Metal equipment can easily be made to meet individual requirements. Monel Metal owes its permanent beauty to a remarkable combination of properties. It cannot rust—it resists corrosion—it has no coating to chip, crack or wear off. Monel Metal's silvery lustre looks well with any color scheme.

Talk to your customers about modernizing with Monel Metal and at the same time let us send you more information about Monel Metal and the educational work that is making it easier for you to get Monel Metal jobs.

WRITE FOR MONEL METAL SHEET METAL LITERATURE

Monel Metal advertising features applications which sheet metal contractors can fabricate and install. This color advertising appears regularly in magazines reaching 5,000,000 families every month.

MONEL METAL

Monel Metal is a registered trade mark applied to a technically controlled nickel-copper alloy of high nickel content. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

INCO MONEL METAL

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK, N. Y.

~ MARKET QUOTATIONS ~

AMERICAN ARTISAN is the only publication quoting Prices on Metals, Sheet Metal Equipment and Supplies, Warm Air Heating Supplies and Accessories, corrected bi-weekly. These quotations are not guaranteed but are obtained from reliable sources and reflect nation-wide market conditions at the time of going to press.

NOTE—These prices are Chicago Warehouse Prices to which must be added territory differentials

METALS

PIG IRON

Chicago Fdy., No. 2	$17.50
Southern Fdy. No. 2	$17.51 to 18.01
Lake Superior Charcoal	27.04
Malleable	17.50

FIRST QUALITY BRIGHT CHARCOAL TIN PLATES

IC	20x28 112 sheets	$22.50
IX	20x28	25.50
IXX	20x28 56 sheets	14.50
IXXX	20x28	15.50
IXXXX	20x28	17.00

TERNE PLATES

	Per Box
IC 20x28, 40-lb. 112 sheets	$24.00
IX 20x28, 40-lb. 112 sheets	26.50
IC 20x28, 25-lb. 112 sheets	20.50
IX 20x28, 25-lb. 112 sheets	23.50
IC 20x28, 20-lb. 112 sheets	19.00
IV 20x28, 20-lb. 112 sheets	22.00

"ARMCO" INGOT IRON PLATES

No. 8 ga.—110 lbs.	$4.15
3/16 in.—100 lbs.	4.05
¼ in.—100 lbs.	3.85

COKE PLATES

Cokes, 80 lbs., base, 20x28	$12.00
Cokes, 90 lbs., base, 20x28	12.20
Cokes, 100 lbs., base, 20x28	13.75
Cokes, 107 lbs., base, IC, 20x28	12.75
Cokes, 135 lbs., base, IX, 20x28	14.75
Cokes, 155 lbs., base, 2X, 56 sheets	8.50
Cokes, 175 lbs., base, 3X, 56 sheets	9.35
Cokes, 195 lbs., base, 4X, 56 sheets	10.25

BLUE ANNEALED SHEETS

Base 10 ga.	per 100 lbs.	$3.35
"Armco" 10 ga.	per 100 lbs.	4.15

ONE PASS COLD ROLLED BLACK

No. 18-20	per 100 lbs.	$3.75
No. 22	per 100 lbs.	3.70
No. 24	per 100 lbs.	3.75
No. 26	per 100 lbs.	3.85
No. 27	per 100 lbs.	3.90
No. 28	per 100 lbs.	4.00

GALVANIZED

No. 16	per 100 lbs.	$3.85
No. 18	per 100 lbs.	3.95
No. 20	per 100 lbs.	4.15
No. 22	per 100 lbs.	4.20
(Standard differentials on extras to apply)		
No. 24	per 100 lbs.	$4.35
No. 26	per 100 lbs.	4.60
No. 27	per 100 lbs.	4.70
No. 28	per 100 lbs.	4.85
"Armco" 24	per 100 lbs.	5.95

BAR SOLDER

Warranted 50-50	per 100 lbs.	$21.05
45-55	per 100 lbs.	19.75
48-52	per 100 lbs.	20.05
Plumbers'	per 100 lbs.	17.40

ZINC

In Slabs $5.50

SHEET ZINC

Cask Lots (600 lbs.)	$12.00
Sheet Lots (100 lbs.)	13.00

BRASS

Sheets, Chicago base	17 ¾ c
Tubing, brazed, Chicago base	24 ¾ c
Tubing, seamless, Chicago base	22 ¼ c
Wire, Chicago base	17 ¾ c
Rods, Chicago base	15 ¾ c

COPPER

Sheets, Chicago base	20 ¼ c
Tubing, seamless, Chicago base	22 ½ c
Wire, plain rd., 8 B. & S. Ga. and heavier	12 ¾ c

LEAD

American Pig	$6.50
Bar	8.50

TIN

Bar Tin	per 100 lbs.	$39.00
Pig Tin	per 100 lbs.	38.00

SHEET METAL SUPPLIES, WARM AIR FURNACE FITTINGS AND ACCESSORIES

ASBESTOS

Paper up to 1/16	6c per lb.
Roll board	7 ½ c per lb.
Mill board 3/32 to ⅛	7 ½ c per lb.
Corrugated paper (250 sq. ft. per roll)	$6.00 per roll

ASBESTOS SEGMENTS

8 in.	per 100 sets	$7.30
9 in.	per 100 sets	8.30
10 in.	per 100 sets	9.30
12 in.	per 100 sets	10.50

CEMENT FURNACE

5-lb. cans, net	$0.40
10-lb. cans, net	0.80
25-lb. cans, net	2.00
Per 100 lbs.	7.50

CLIPS

Damper	
No-Rvet Steel, with tail pieces, per gross	$9.50
Rivet Steel, with tail pieces, per gross	7.50
Tail pieces, per gross	2.40

COPPER FOOTING

Copper Footing ..... 39 %

CORNICE BRAKES

Chicago Steel Bending

Nos. 1 to 6B ..... Net

CUT-OFFS

Cal., plain, round or cor. rd.

26 gauge	30 %
28 gauge	35 %

DAMPERS

Yankee Warm Air

7 inch, doz.	$1.60
8 inch, doz.	2.20
9 inch, doz.	2.60
10 inch, doz.	2.80
12 inch, doz.	3.50
14 inch, doz.	5.00

EAVES TROUGH

Galv. Crimpedge, crated	75-10 %
Zinc	60 %

ELBOWS

Conductor Pipe

Galv. plain or corrugated, round flat Crimp.

28 gauge	60 %
26 gauge	45 %
24 gauge	15 %

Galv. Terne Steel

Plain Rd. and Rd. Corr.

28 gauge	60 %
26 gauge	45 %
24 gauge	15 %

Square Corrugated

28 gauge	50 %
26 gauge	35 %

Portico Elbows

Standard Gauge Conductor Pipe, plain or corrugated.

Not nested	70 & 5 %
Nested solid	70 & 5 %

Sq. Corr., A. & B. & Octagon

28 gauge	50 %
26 gauge	35 %

Portico

1, 1¼, 1½ inch ..... 45 %

Copper

16 oz. all designs ..... 45 %

Zinc

All styles ..... 60 %

ELBOWS—Stove Pipe

1-piece Corrugated, Uniform Blue No. 28 Gauge.	Doz.
5 inch	$1.15
6 inch	1.25
7 inch	1.75

Adjustable—Uniform Blue

No. 28 Gauge, Uniform Blue.	
5 inch	$1.60
6 inch	1.75
7 inch	2.10

WOOD FACES—60 % off list.

FIRE POTS

	Each
No. 02 Gasoline Torch, 1 qt.	$5.13
No. 9250, Kerosene, or Gasoline Torch, 1 qt.	6.50
No. 10 Tinner's Furnace Square tank, 1 gal.	11.20
No. 15 Tinner's Furnace Round tank, 1 gal.	10.70
No. 21 Gas Soldering Furnace	8.00
No. 110 Automatic Gas Soldering Furnace	10.50

GLASS

Single and Double Strength, A, all brackets	85 %
Single and Double Strength, B, all brackets	87 %

HANGERS

Conductor Pipe

Milcor Perfection Wire	25 %
Milcor Triplex Wire	10 %

Eaves Trough

Steel (galv. after forming) from list	45 %
Selflock E. T. Wire, List	10 %

HOOKS

Conductor

"Direct Drive" Wrought Iron for wood or brick ..... 15 %

MITRES

Galvanized Steel Mitres

28 gauge	70
26 gauge	60-20

PASTE

Asbestos Dry Paste

200-lb. barrel	$15.00
100-lb. barrel	7.75
50-lb. pail	4.50
25-lb. pail	2.50
10-lb. bag	1.20
5-lb. bag	0.60

PIPE

Galvanized

Crated and nested (all gauges)	75-7 ½ %
Crated and not nested (all gauges)	75-2 ½ %

Furnace Pipe

Double Wall Pipe and Fittings	60 %
Single Wall Pipe, Round Galvanized Pipe	60 %
Galvanized and Tin Fittings	60 %

Lead

Per 100 lbs. $12.50

Stove Pipe

"Milcor" "Titelock" Uniform Blue Stove

28 gauge, 5 inch U. C. nested	$11.00
28 gauge, 6 inch U. C. nested	12.00
28 gauge, 7 inch U. C. nested	14.00
30 gauge, 5 inch U. C. nested	10.25
30 gauge, 6 inch U. C. nested	11.00
30 gauge, 7 inch U. C. nested	13.00

T-Joint Made Up

6 inch, 28 ga. ..... per doz. $3.40

REGISTERS AND FACES

Floor Registers

Except Cast Iron	40 & 10 %
Cast Iron	20 %

Baseboard

2-Piece	40 & 10 %
1-Piece	40-10 & 20 %

Adjustable Ventilators

Adjustable Cold Air Faces	40 & 10 %
Adjustable Ventilators	40 & 10 %

RIDGE ROLL

Galv. Plain Ridge Roll, b'dld	75-15-5 %
Galv., Plain Ridge Roll, crated	75-15 %

SCREWS

Sheet Metal

7, ½ x ⅛, per gross	$0.52
No. 10, ¾ x 3/16, per gross	0.68
No. 14, ⅞ x ¼, per gross	0.83

SHEARS, TINNERS' AND MACHINISTS'

Viking $22.00

Lennox Throatless

No. 18	35 %
Shear blades	10 %

(f. o. b. Marshalltown, Iowa.)

SHOES

Galv. 28 Gauge, Plain or Corrugated, round flat crimp	60 %
26 gauge, round flat crimp	45 %
24 gauge, round flat crimp	15 %

SNIPS

Tinners' ..... Net

VENTILATORS

Standard	30 to 40 %
Milcor	Net

FOLLOWS ANY LINE, ACCURATELY

THE line is always in plain sight when cutting with the "Mighty Midget." It makes no difference whether the line is straight, curved or irregular you can follow it exactly without leaving any burr or distortion of metal.

With a speed of 15 feet per minute you will find this a great time saving tool in your shop. It pays for itself many times over.

Capacity 18 U. S. Gauge (.050″) sheet iron, other materials in proportion. The convenient shape of the handle permits using the "Mighty Midget" in almost every position.

STANLEY - UNISHEAR
"MIGHTY MIDGET"
"The power driven hand shear"

Price 110 volt motor $75.00
Price 220 volt motor $78.00

Send for full information on this labor saving tool. You'll find a hundred uses for it in your shop.

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New Britain, Conn.

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Kansas City Los Angeles Seattle San Francisco Montreal Toronto

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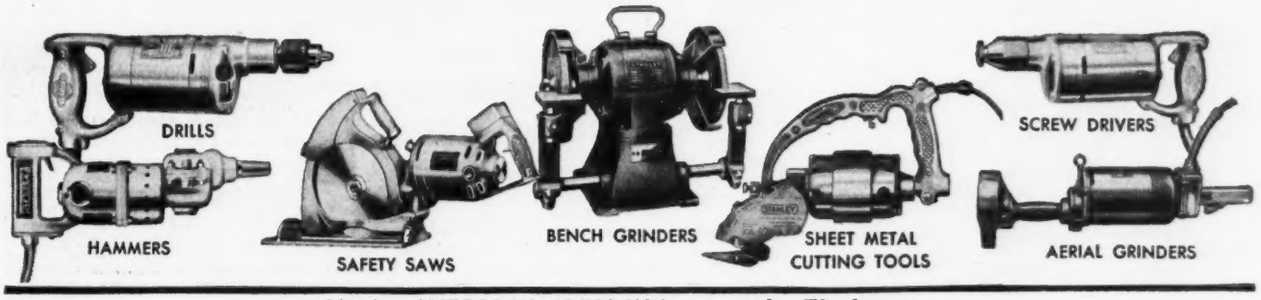

BUYERS' DIRECTORY

Air Cleaners
American Fdy. & Furnace Co., Bloomington, Ill.
Meyer & Bro. Co., F., Peoria, Ill.
Warm Air Furnace Fan Co., Cleveland, Ohio
Watt Mfg. Co., Sterling, Ill.

Air Washers
A. Gehri & Co., Tacoma, Wash.
Watt Mfg. Co., Sterling, Ill.

Aluminum Sheets
J. M. & L. A. Osborn Co., Cleveland, Ohio

Asbestos—Liquid
Liquid Asbestos Mfg. Co., Des Moines, Iowa

Bearings
Fafnir Bearing Co., New Britain, Conn.

Blast Gates
Berger Bros. Co., Philadelphia, Pa.

Blower Bearings
Fafnir Bearing Co., New Britain, Conn.

Blowers—Furnace
American Fdy. & Furnace Co., Bloomington, Ill.
American Machine Products Co., Marshalltown, Iowa
A. Gehri & Co., Tacoma, Wash.
Brundage Co., Kalamazoo, Mich.
Lakeside Co., Hermansville, Mich.
Warm Air Furnace Fan Co., Cleveland, Ohio
Watt Mfg. Co., Sterling, Ill.

Bolts—Stove
Lamson & Sessions Co., Cleveland, Ohio
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Brakes—Bending
Dreis & Krump Mfg. Co., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Brakes—Cornice
Dreis & Krump Mfg. Co., Chicago, Ill.

Brass and Copper
American Brass Co., Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Copper & Brass Research Association, New York, N. Y.
Revere Copper & Brass, Rome, N. Y.

Bronze
Revere Copper & Brass, Rome, N. Y.

Cans—Garbage
Diener Mfg. Co., G. W., Chicago, Ill.
Osborn Co., The J. M. & L. A., Cleveland, Ohio

Castings—Malleable
Fanner Mfg. Co., Cleveland, Ohio

Ceilings—Metal
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Chaplets
Fanner Mfg. Co., Cleveland, Ohio

Cleaners—Vacuum
Brillion Furnace Co., Brillion, Wis.
National Super Service Co., Toledo, Ohio

Copper
American Brass Co., Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Revere Copper & Brass, Rome, N. Y.
Rockford Sheet Steel Co., Rockford, Ill.

Cornices
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Covering—Furnace Pipe
Liquid Asbestos Mfg. Co., Des Moines, Iowa

Cut-offs—Rain Water
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Dampers—Quadrants—Accessories
Aeolus Dickinson Chicago, Ill.
Hart & Cooley Co., Holland, Mich.
Howes Co., S. M., Boston, Mass.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Parker-Kalon Corp., New York, N. Y.

Dampproofings
Lastik Products Corp., Pittsburgh, Pa.

Damper Regulators
Sheer Co., H. M., Quincy, Ill.

Diffuser—Air Duct
Aeolus Dickinson Chicago, Ill.

Drills—Electric
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
J. M. & L. A. Osborn Co., Cleveland, Ohio
The Stanley Electric Tool Co., New Britain, Conn.

Drive Screws—Hardened Metallic
Parker-Kalon Corp., 190 Varick St., New York

Dust Eliminator
Dustless Ash Co., Muskegon, Mich.

Eaves Trough
Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Rockford Sheet Steel Co., Rockford, Ill.

Elbows and Shoes—Conductor
Apex Gutter Hanger Corp., New York, N. Y.
Barnes Metal Products Co., Chicago, Ill.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Rockford Sheet Steel Co., Rockford, Ill.

Fittings—Conductor
Barnes Metal Products Co., Chicago, Ill.
Braden Mfg. Co., Terre Haute, Ind.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Fluxes—Soldering
Kester Soldering Co., Chicago, Ill.

Furnace Cement
Connors Paint Mfg. Co., Wm., Troy, N. Y.
Lastik Products Corp., Pittsburgh, Pa.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Furnace Chain
Hart & Cooley Co., Holland, Mich.

Furnace Cleaners—Suction
Brillion Furnace Co., Brillion, Wis.
National Super Service Co., Toledo, Ohio

Furnace Fans
A-C Mfg. Co., Pontiac, Ill.
American Fdy. & Furnace Co., Bloomington, Ill.
Brundage Co., The, Kalamazoo, Mich.
Lakeside Co., Hermansville, Mich.
Robinson Co., A. H., Massillon, Ohio
Warm Air Furnace Fan Co., Cleveland, Ohio
Watt Mfg. Co., Sterling, Ill.

Furnace Filters
Warm Air Furnace Fan Co., Cleveland, Ohio

Furnace Paste
Western Mineral Products Co., Omaha, Neb.

Furnace Pokers
Fanner Mfg. Co. Cleveland, Ohio

Furnace Pulleys
Hart & Cooley Co., Holland, Mich.

Furnace Regulators
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Sheer Co., H. M., Quincy, Ill.
Tisch, Inc., Charles, Brooklyn, N. Y.
White Mfg. Co., Minneapolis, Minn.

Furnace Rings
Forest City-Walworth Run Foundries Co., Cleveland, Ohio
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Furnace Switch—Automatic
Payne Furnace & Supply Co., Beverly Hills, Cal.

Furnaces—Gas
Calkins & Pearce, Columbus, Ohio
Lennox Furnace Co., Marshalltown, Iowa
Mueller Furnace Co., L. J., Milwaukee, Wis.
Payne Furnace & Supply Co., Beverly Hills, Cal.
Rudy Furnace Co., Dowagiac, Mich.
Wise Furnace Co., Akron, Ohio

Furnaces—Oil Burning
Motor Wheel Corp., Heater Div., Lansing, Mich.

Furnaces—Warm Air
Agricola Furnace Co., Gadsden, Ala.
American Fdy. & Furnace Co., Bloomington, Ill.
American Furnace Co., St. Louis, Mo.
The Beckwith Co., Dowagiac, Mich.
Brillion Furnace Co., Brillion, Wis.
Farris Furnace Co., Springfield, Ill.
Forest City-Walworth Run Fdy., Cleveland, Ohio
Fox Furnace Co., Elyria, Ohio
Henry Furnace & Fdy. Co., Cleveland, Ohio
Hess Warming & Ventilating Co., Chicago, Ill.
Langenberg Mfg. Co., St. Louis, Mo.
London Furnace Co., London, Ohio
Lennox Furnace Co., Marshalltown, Iowa Syracuse, N. Y.
May Fiebeger Furnace Co., Newark, Ohio
Meyer Furnace Co., The, Peoria, Ill.
Midland Furnace Co., Columbus, Ohio
Motor Wheel Corp., Heater Div., Lansing, Mich.
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Payne Furnace & Supply Co., Beverly Hills, Cal.
Premier Warm Air Heater Co., Dowagiac, Mich.
Peerless Foundry Co., Indianapolis, Ind.
Rybolt Heater Co., Ashland, Ohio
Rudy Furnace Co., Dowagiac, Mich.
Standard Fdy. & Furnace Co., De Kalb, Ill.
Success Heater Mfg. Co., Des Moines, Iowa
Schwab & Sons Co., R. J., Milwaukee, Wis.
Waterman-Waterbury Co., Minneapolis, Minn.
Western Steel Products Co., Duluth, Minn.
Wise Furnace Co., Akron, Ohio

Gas Burning Attachments
Munkel-Rippel Heating Co., Columbus, Ohio

Grilles
Auer Register Co., Cleveland, Ohio
Harrington & King Perforating Co., Chicago, Ill.
Hart & Cooley Co., New Britain, Conn.
Tuttle & Bailey Mfg. Co., Chicago, Ill.

Guards—Machine and Belt
Harrington & King Perforating Co., Chicago, Ill.

Handles—Boiler
Berger Bros. Co., Philadelphia, Pa.

Handles—Soldering Iron
Hyro Mfg. Co., New York, N. Y.

Handles—Furnace Door
Fanner Mfg. Co., Cleveland, Ohio

Hangers—Eaves Trough
Apex Gutter Hanger Corp., New York, N. Y.
Berger Bros. Co., Philadelphia, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Heat Regulation Systems
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Qisch, Inc., Charles, Brooklyn, N. Y.
Sheer Co., H. M., Quincy, Ill.
White Mfg. Co., Minneapolis, Minn.

Heaters—Cabinet
Fox Furnace Co., Elyria, Ohio
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Motor Wheel Corp., Heater Division, Lansing, Mich.
Payne Furnace & Supply Co., Beverly Hills, Cal.
Waterman-Waterbury Co., Minneapolis, Minn.

Heaters—School Room
Meyer Furnace Co., The, Peoria, Ill.
Western Steel Products Co., Duluth, Minn.
Waterman-Waterbury Co., Minneapolis, Minn.

Humidifiers
Automatic Humidifier Co., Cedar Falls, Iowa
Diener Mfg. Co., G. W., Chicago, Ill.
Meyer & Bro. Co., F., Peoria, Ill.
Sheer Co., H. M., Quincy, Ill.

Lath—Expanding Metal
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Machines—Crimping
Bertsch & Co., Cambridge City, Ind.

Machinery—Culvert
Bertsch & Co., Cambridge City, Ind.
Interstate Machinery Co., Chicago, Ill.

Machines—Tinsmith's
Bertsch & Co., Cambridge City, Ind.
Dreis & Krump Mfg. Co., Chicago, Ill.
Hyro Mfg. Co., New York, N. Y.
Interstate Machinery Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Iowa
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
The Stanley Electric Tool Co., New Britain, Conn.
Whitney Mfg. Co., W. A., Rockford, Ill.

Metals—Perforated
Harrington & King Perforating Co., Chicago, Ill.

Miters—Eaves Trough
Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Braden Mfg. Co., Terre Haute, Ind.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Nails—Copper and Brass
Chase Brass & Copper Co., Waterbury, Conn.
Revere Copper & Brass, Rome, N. Y.

(Continued on page 54)

The "Torrid" Furnace is designed to give a tremendous amount of heat, much more than that furnished by the ordinary tinner's furnace.

A fuel saver and generating machine of the finest quality made at the price.

GEO. W. DIENER MFG. CO.
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"American Seal"

FURNACE CEMENT

Roof Cement—Stove Putty
Plumbers Putty

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Established 1852
TROY NEW YORK

JAMES L. PERKINS, Western Distributor
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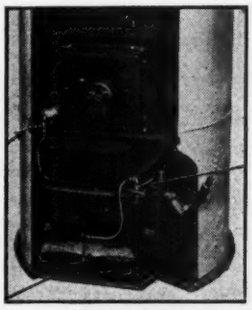
It settles the dust in the ashpit



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MAKES removing ashes a clean, easy job and that's why you can make good profits selling it. Every furnace user will appreciate this new Patented feature of **your** installations.

It means more furnace jobs and pleased customers.

It sprays a fine moisture over the ashes and keeps dust from spreading. Saves grates, adds to furnace efficiency and is easily attached. The sleeve connection allows the nozzle to swing out of the way with door. High grade in all respects.

Write today for full details, circular and prices

DUSTLESS ASH COMPANY
MUSKEGON, MICHIGAN

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WHITNEY Lever PUNCHES

For over 20 years the leader

No. 2 Punch

Length 23 in.
Wt. 13 lbs.

This is the punch that made the Whitney line famous and it is still the punch that is preferred by thousands of men for accurate and quick punching. Depth of throat, 1½ inches. Capacity, ⅞ inch through ¼ inch iron or equivalent. Extra punches and dies in 13 stock sizes, ⅜ to ½ inch by 1/32 inch. Also made in 64ths special.

Channel Iron Punch

A Companion to No. 2 Punch

Every part of this punch and the No. 2 is interchangeable. Length, 23 inches. Weight, 16½ lbs. Punches to center of 4 inch Channel Iron. Capacity, ¼ inch hole through ¼ inch iron. Same 13 sizes of extra punches and dies as used in No. 2 Punch. Also made in 64th sizes specially.

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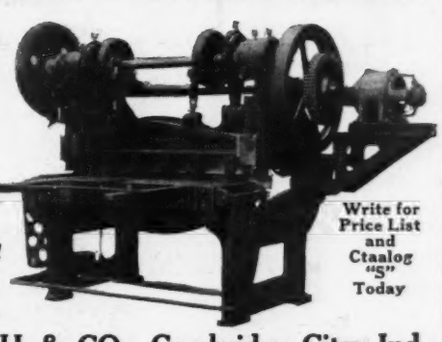
BERTSCH POWER SHEAR

BELT OR MOTOR DRIVE

Takes lightest sheets to Heaviest Plates

Built in all Standard Sizes and Capacities



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THE FANNER MFG. CO. BROOKSIDE PARK, CLEVELAND, OHIO

Say you saw it in AMERICAN ARTISAN—Thank you!

BUYERS' DIRECTORY

(Continued from page 52)

Nails—Hardened Masonry

Parker-Kalon Corp., New York, N. Y.

Oil Burners

Bock Oil Burner Co., Madison, Wis.
Crystal Oil Burner Corp., New York, N. Y.
McIlvaine Burner Corp., Evanston, Ill.
Silent Automatic Corp., Detroit, Mich.

Paint

Connors Paint Mfg. Co., Wm., Troy, N. Y.

Perforated Metals

Harrington & King Perforating Co., Chicago, Ill.

Pipe and Fittings—Furnace

Henry Furnace & Fdy. Co., Cleveland, Ohio
Lamneck & Co., W. E., Columbus, Ohio
Meyer & Bro. Co., F., Peoria, Ill.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Peerless Foundry Co., Indianapolis, Ind.

Pipe and Fittings—Stove

Meyer & Bro. Co., F., Peoria, Ill.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Pipe—Conductor

Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Punches

Bertsch & Co., Cambridge City, Ind.
Hyro Mfg. Co., New York
Interstate Machinery Co., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
W. A. Whitney Mfg. Co., Rockford, Ill.

Punches—Combination Bench and Hand

Hyro Mfg. Co., New York, N. Y.

Punches—Hand

Hyro Mfg. Co., New York, N. Y.
W. A. Whitney Mfg. Co., Rockford, Ill.

Putty—Stove

Connors Paint Mfg. Co., Wm., Troy, N. Y.

Radiator Cabinets

Hart & Cooley Co., Holland, Mich.

Ranges—Gas

The Beckwith Co., Dowagiac, Mich.
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.

Registers—Warm Air

Auer Register Co., Cleveland, Ohio
Forest City-Walworth Run Foundries Co., Cleveland, Ohio
Hart & Cooley Co., Holland, Mich.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Ku-No Register Mfg. Co., St. Louis, Mo.
Lamneck & Co., W. E., Columbus, Ohio
Meyer & Bro. Co., F., Peoria, Ill.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Mueller Furnace Co., L. J., Milwaukee, Wis.
Rock Island Register Co., Rock Island, Ill.
Symonds Register Co., St. Louis, Mo.
Tuttle & Bailey Mfg. Co., Chicago, Ill.

Registers—Wood

American Wood Register Co., Plymouth, Ind.
Auer Register Co., Cleveland, Ohio
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Regulators—Heat

Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
H. M. Sheer Co. Chicago, Ill.
White Mfg. Co., Minneapolis, Minn.

Ridging

American Rolling Mill Co., Middletown, Ohio
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Rivets—Stove

Lamson & Sessions Co., Cleveland, Ohio
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Rods—Stove

Lamson & Sessions Co., Cleveland, Ohio

Rolls—Forming

Bertsch & Co., Cambridge City, Ind.
Interstate Machinery Co., Chicago, Ill.

Roofing Cement

Connors Paint Mfg. Co., Wm., Troy, N. Y.
Lastik Products Corp., Pittsburgh, Pa.

Roof Paints

Lastik Products Corp., Pittsburgh, Pa.

Roof—Flashing

Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Roofing—Iron and Steel

American Rolling Mill Co., Middletown, Ohio
Central Alloy Division, Republic Steel Corp., Youngstown, Ohio
Inland Steel Co., Chicago, Ill.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Ryerson & Sons, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Roofing—Tin

Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Taylor Co., N. & G., Philadelphia, Pa.

Rubbish Burners

Hart & Cooley Co., New Britain, Conn.

Schools—Sheet Metal Pattern Drafting

St. Louis Technical Institute, St. Louis, Mo.

Schools—Warm Air Heating

St. Louis Technical Institute, St. Louis, Mo.

Screws—Hardened Metallic Drive

Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Parker-Kalon Corp., 200 Varick St., New York

Screws—Hardened Self-Tapping, Sheet Metal

Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Parker-Kalon Corp., 200 Varick St., New York

Screens—Perforated Metal

Harrington & King Perforating Co., Chicago, Ill.

Scuppers

Aeolus Dickinson Chicago, Ill.

Shears—Hand and Power

Interstate Machinery Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Ia.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
The Stanley Electric Tool Co., New Britain, Conn.
Viking Shear Co., Erie, Pa.

Sheet Metal Screws—Hardened, Self-Tapping

Parker-Kalon Corp., 200 Varick St., New York

Sheets—Alloy

Central Alloy Division, Republic Steel Corp., Youngstown, Ohio
International Nickel Co., New York, N. Y.

Sheets—Black and Galvanized

American Rolling Mill Co., Middletown, Ohio
Central Alloy Division, Republic Steel Corp., Youngstown, Ohio
Inland Steel Co., Chicago, Ill.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Rockford Sheet Steel Co., Rockford, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
Taylor Co., N. & G., Philadelphia, Pa.

Sheets—Iron

American Rolling Mill Co., Middletown, Ohio
Central Alloy Division, Republic Steel Corp., Youngstown, Ohio
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Sheets—Tin

Taylor Co., N. & G., Philadelphia, Pa.

Shingles and Tiles—Metal

Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Sifters—Ash

Diener Mfg. Co., G. W., Chicago, Ill.

Sign Equipment—Electric

Metal Products Co., Milwaukee, Wis.

Sky Lights

Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Snips

Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Solder—Acid Core

Kester Solder Co., Chicago, Ill.

Solder—Self-Fluxing

Kester Solder Co., Chicago, Ill.

Solder—Rosin Core

Kester Solder Co., Chicago, Ill.

Solder

Kester Solder Co., Chicago, Ill.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Soldering Coppers

Revere Copper & Brass, Rome, N. Y.

Soldering Furnaces

Diener Mfg. Co., G. W., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Specialties—Hardware

Diener Mfg. Co., G. W., Chicago, Ill.

Stars—Hard Iron Cleaning

Fanner Mfg. Co., Cleveland, Ohio

Tinplate

Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Taylor Co., N. & G., Philadelphia, Pa.

Tools—Tinsmith's

Bertsch & Co., Cambridge City, Ind.
Dries & Krump Mfg. Co., Chicago, Ill.
Hyro Mfg. Co., New York, N. Y.
Interstate Machinery Co., Chicago, Ill.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Rockford Sheet Steel Co., Rockford, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
The Stanley Electric Too. Co., New Britain, Conn.
Viking Shear Co., Erie, Pa.
Whitney Mfg. Co., W. A., Rockford, Ill.

Torches

Diener Mfg. Co., G. W., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Trade Extension

Copper & Brass Research Association
National Association of Flat Rolled Steel Manufacturers, Cleveland, Ohio

Trimmings—Stove and Furnace

Fanner Mfg. Co., Cleveland, Ohio

Vacuum Cleaner—Furnace

Brillion Furnace Co., Brillion, Wis.
National Super Service Co., Toledo, Ohio

Ventilators—Floor

Aeolus Dickinson Chicago, Ill.

Ventilators—Roof

Aeolus Dickinson Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Paul R. Jordan & Co., Indianapolis, Ind.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

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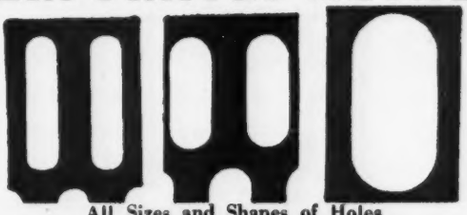

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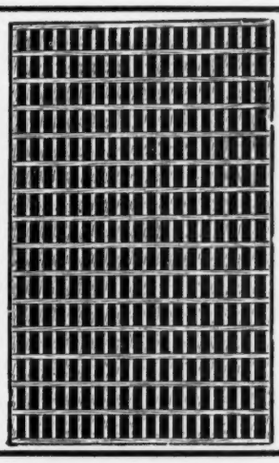

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Capacity 10 gauge sheets
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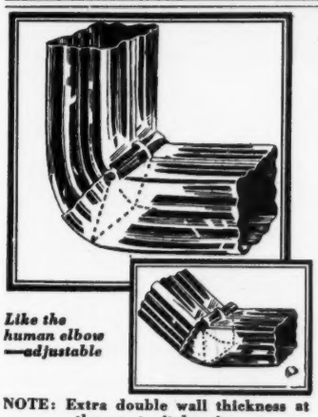
Alphabetical List *of* Advertisers

Firms represented in this issue are identified by the folio of the page on which their advertising appears. Advertising which appears in alternate issues is marked with an asterisk.

A-C Mfg. Co. 17
Aeolus Dickinson* ....
Agricola Furnace Co. 18
American Brass Co. 47
American Fdy. & Furn. Co. 18
American Furnace Co.* ....
American Machine Products Co. 17
American Rolling Mill Co.* ....
American Wood Register Co. 55
Apex Gutter Hanger Corp. 57
Auer Register Co.* ....
Automatic Humidifier Co.* ....
Barnes Metal Prod. Co. 59
Beckwith Co. 22
Berger Bros. Co. 55
Bertsch & Co. 53
Bock Oil Burner Co. 19
Braden Mfg. Co.* ....
Brillion Furnace Co. 14
Brundage Co. 11
Calkins & Pearce* ....
Central Alloy Division Republic Steel Corp.* ....
Chase Brass & Copper Co.* ....
Connors Paint Co., Wm. 53
Copper and Brass Research Assn.* ....
Crystal Oil Burner Co.* ....
Diener Mfg. Co., Geo. W. 53
Dreis & Krump Mfg. Co. 55
Dustless Ash Co. 53
Eissler Hardware 19
Fafnir Bearing Co.* ....
Fanner Mfg. Co. 53
Farris Furnace Co.* ....
Forest City-Walworth Run Foundries Co.* ....
Fox Furnace Co.* ....
Gehri, A., & Co.* ....
Harrington & King Perf. Co. 55
Hart & Cooley Co. 9
Henry Furn. & Fdy. Co. 14
Hess Warming & Ventilating Co.* ....
Howes Co., S. M.* ....
Hyro Mfg. Co. 8
Independent Reg. & Mfg. Co.* ....
Inland Steel Co. ..... Front Cover
International Nickel Co. 49
Interstate Machinery Co. 58
Jordan & Co., Paul R.* ....
Kester Solder Co.* ....
Ku-No Register Mfg. Co.* ....
Lakeside Co. 17
Lammeck & Co., W. E.* ....
Lamson & Sessions Co., The 57
Langenberg Mfg. Co.* ....
Lastik Products Co. 13
Lennox Furnace Co. 14
Liquid Asbestos Mfg. Co. 18
London Furnace Co.* ....
Marshall Furnace Co.* ....
Marshalltown Mfg. Co.* ....
May-Fiebeger Co. 12
McIlvaine Burner Corp. 18
Metal Products, Inc.* ....
Meyer & Bro. Co., F. 6
Meyer Furnace Co.* ....
Midland Furnace Co.* ....
Milcor Steel Co. ..... Back Cover
Miller & Doing, Inc.* ....
Minneapolis-Honeywell Reg. Co.* ....
Motor Wheel Corp., Heater Div. 5
Munkel-Rippel Heating Co. 18
Mt. Vernon Furnace & Mfg. Co. 14
Mueller Furnace Co.* ....
National Assn. of Flat Rolled Steel Mnfrs.* ....
National Super Service Co.* ....
Osborn Co., The J. M. & L. A. 55
Parker-Kalon Corp.* ....
Payne Furnace & Supply Co.* ....
Peck, H. E. 58
Peerless Foundry Co.* ....
Premier Warm Air Heater Co. 12
Republic Steel Corp.* ....
Revere Copper & Brass, Inc. 3
Richardson & Boynton Co.* ....
Robinson Co., A. H.* ....
Rock Island Register Co. 16
Rockford Sheet Steel Co.* ....
Rudy Furnace Co.* ....
Ryerson & Son, Inc., Jos. T. 21
Schwab & Sons Co., R. J. 18
Sheer Co., H. M. 18
Silent Automatic Corp.* ....
Standard Fdy. & Furn. Co. 15
Stanley Electric Tool Co. 51
St. Louis Tech. Inst. 58
Success Heater Mfg. Co. 2
Symonds Register Co.* ....
Taylor Co., N. & G.* ....
Tisch, Inc., Charles 19
Tuttle & Bailey Mfg. Co.* ....
Viking Shear Co. 57
Warm Air Furnace Fan Co. 10
Watt Mfg. Co. 16
Waterman-Waterbury Co. 7
Western Mineral Products Co. 57
Western Steel Products Co. 4
White Mfg. Co. 17
Whitney Mfg. Co., W. A. 53
Wise Furnace Co. 15

THE BUYERS' DIRECTORY APPEARS ON PAGES 52 AND 54



Like the human elbow —adjustable

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You have been waiting for this *adjustable* down-spout elbow—

THE "MASTER" ADJUSTABLE ELBOW

Is a Time and Labor Saver

This patented elbow can be adjusted to any degree of pitch between 15 and 90°. No tools are needed. The patented features of this elbow enable you to connect gutter and down spout in a few seconds.

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A new furnace paste

FOR BETTER, NEATER AND QUICKER WORK

Non-Cereal—Non-Souring

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Larco Paste can be kept on hand mixed ready for use. It has greater covering qualities. It slips easily but adheres permanently.

Write for circular which tells all about it—get Larco prices.

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VIKING SHEAR

Compound LEVER Handle—Removable Blades

A child can work them

VIKING SHEAR CO., Erie, Pa.

WANTS AND SALES

Yearly subscribers to the AMERICAN ARTISAN may insert advertisements of not more than fifty words in our Want and Sales Columns WITHOUT CHARGE for three insertions.

Such advertisements, however, must be limited to help or situation wanted, tools or equipment for sale, to exchange or to buy, business for sale or location desired, and must reach our office ten days prior to date of publication. This privilege is not extended to manufacturers or jobbers—or those making a business of buying and selling used machines—employment agencies and brokers.

When sending advertisement state whether your name or blind number is to be used.

BUSINESS CHANCES

For Sale—Sheet metal, heating and tin business in Central Indiana. Good chance to add plumbing. Retiring after 31 years. Rent cheap, with lease if wanted. Will sell for less than inventory. Less than $2,000 will handle this on part time if wanted. Address G-527, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Illinois.

For Sale—A-1 sheet metal works with hardware store combined, in Northern Illinois, for someone looking for a good up-to-date business who can handle same. This is a great opportunity for advancement. Write H-527, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Illinois.

For Sale or Exchange—For hardware or plumbing and tin shop with building, a 127-acre farm in Northern Indiana. Prefer property in South or Southwest. Address S. N. Eversole, Baldwin Lake Road, Bristol, Ind. J-527

SITUATION WANTED

ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By an experienced furnace salesman, also experienced in greenhouse heating. Can lay out work in furnaces also greenhouses in steam and water. Sixteen years with one company. In position to go to any state. Address C-527, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

SITUATION WANTED

Sheet metal shop superintendent thoroughly experienced in assuming full responsibility on all types of fabricating and carrying to completion outside construction jobs. Can handle any number of men satisfactorily. Several years' experience with largest shops and contractors in country. Experienced in ventilation, humidity control, blower systems, etc. Go anywhere. Address O-527, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

An experienced superintendent of sheet metal construction work is open for a position offering greater responsibilities and possibilities than he has at present. Possesses complete practical knowledge of estimating, detailing and pattern drafting backed with 20 years' experience. He has superintended the installation of heating and ventilating equipment in some of the largest contracts in Ohio. He is an American, married with family, good health, an industrious worker, can furnish A-1 references, and is willing to locate wherever the best opportunity exists. Address B-527, AMERICAN

Situation Wanted—By plumber, fitter and sheet metal worker. Many years of experience. Used to high-class work and can handle men to advantage. At present employed at union wages, but wanted to make a change before winter. No bad habits. Prefer Central West States. If interested, write, giving hours and wages paid. Address Box 348, Saco, Mont. D-527

SITUATION WANTED

Situation Wanted—For a graduate of the Mooseheart Sheet Metal School. This boy is about 21 years of age and has been working in a general sheet metal shop in Chicago for approximately two years. He has had considerable experience on furnace and general outside work. Now employed but wishes to leave Chicago for employment in a shop where he can complete his trade and have an opportunity for advancement. For further information and recommendations, address Mooseheart Sheet Metal Department, Mooseheart, Ill. E-527

Situation Wanted—A sheet metal mechanic that knows his stuff, is looking for position. Jobbing, cornice, skylight, blow pipe and ventilation as well as layout work. Experienced in factory work. Sober, married, steady, a hustler and about 30 years of experience. 48 years of age, good health. Please state particulars and pay. Address E. W. Hiatt, care of A. J. Balsiger, Underwood, Wash. R-526

Situation Wanted—Combination sheet metal worker, plumber, steam and hot water fitter and furnace man. Would like shop connected with hardware store. Year around job. Middle aged, married and sober. Have worked at these trades 22 years. State wages. Can come at once. Address P-526, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By hardware man who has had 12 years experience in hardware, sheet metal and furnace work. Can handle one or all. Middle west town preferred with steady work. No objection to small or large town. Address T-526, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Position Wanted—By man with 28 years' experience in tinning, furnace work, plumbing, spouting and all kinds of general work. Prefer Iowa or Wisconsin. Address O-526, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

HELP WANTED

Reliable Tinner Wanted—Must have experience in school house heating and ventilating as well as all around sheet metal work. Address Benton Sheet Metal Works, 122 Water St., Benton Harbor, Mich. W-526

Experienced Radiator Repair Man Wanted—Central Wisconsin city of 9,000. Address X-526, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

HELP WANTED

Wanted — Reliable industrial sheet metal worker, not over 40 years of age—capable without instructions to handle any and all kinds of shop job work—blow pipe—skylight—cornice—ventilationand furnace jobs—must be willing to do in and outside jobs from start to finish. Address H. T. Klugel, North Emporia, Virginia. A-527

Wanted—Tinner and furnace man, must be good clean workman. Southern Wisconsin town. State wages and how soon you can come. Need man at once. Address H-525, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Wanted—A sheet metal worker with furnace installation experience. Must also be able to do plumbing work as well as pump work. Address Johnson Brothers, Little Rock, Iowa. T-525

Wanted—A first-class tinner and furnace man. One who can canvass the city for work, and work on a percentage basis. We have a city of 10,000 with four shops. Plenty of work if one would go after it. Sickness compels me to give up the work. Address F-527, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

TOOLS AND MACHINES

For Sale—30″ square shears with extra blade, combination bench machine with five sets rolls, 20″ groving machine, 30″ roller, double seaming machine, large bench shears, beader with two sets rolls, setting down machine, small burring machine, breakhorn stake, sound stake, Lufkin pattern rule and chart in wooden case. All in good condition and for $130.00. Will sell separate. Address Z-526, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Wanted—One second hand Brillion Vacuum Cleaner complete. Must be reasonable and in good condition. Address O-524, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.
Wanted—Used 8 or 10 ft. brake to bend ¼″ plate, hand or power driven. Mail description and price to Jacob Brenner, Fond du Lac, Wis. L-525

For Sale—1—20″ bar folder, $15.00. 1—20″ groving machine, $7.00. 1—Large burring machine, $8.00. 1—Setting down machine, $5.00. All are Pexto incased machines in good order. Also have some hand tools cheap. Address Geo. Shoop, Conneaut, Ohio. O-525

TOOLS AND MACHINES

Wanted—Used 8 foot all steel brake 18 ga. capacity. 1 — 30″ forming roll, 1 — 30″ pipe folder, 1—crimper and beader, 1—5″ vise. State condition, price and make. Address R. J. Reichenback, 1308 Marsac Street, Bay City, Mich. S-525

Wanted—Five or six foot power brake, half inch capacity; five or six foot bending rolls, one-quarter inch capacity; power rotary shear, quarter inch capacity. Address G-525, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Wanted—One second hand 3½″ x 37″ or 48″ forming roll. Must be in good condition. State lowest cash price for same. Address C-525, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

For Sale—All steel box and pan brake, length 72″, weighs about 2000 pounds. This pan used about 10 days. Priced to sell. Address Barnum Supply House, Mankato, Minnesota. D-525

Wanted—Tinners' tools, must be in good condition and priced right. Give list of tools for sale. Address Earl S. Beaudry, Newton, Kansas. P-525

For Sale—One 10-in. cornice brake, almost new, made by Dreis & Krump Mfg. Co. Price $190. Address A. W. Dietzel, 207 East 4th, Hermann, Mo. K-527

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ATTENTION FURNACE SALESMEN

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OVER 300 PIECES OF SHEET METAL MACHINERY ALWAYS IN STOCK—

No matter what machine you need the chances are it is listed in our stock bulletin and at a price that can't be beat. These sheets are corrected daily.

HERE ARE A FEW SPECIAL BARGAINS

60″ x 4″ Niagara Power Roller	$250.00
36″ x 2½ Niagara Slip Roll on Stand	75.00
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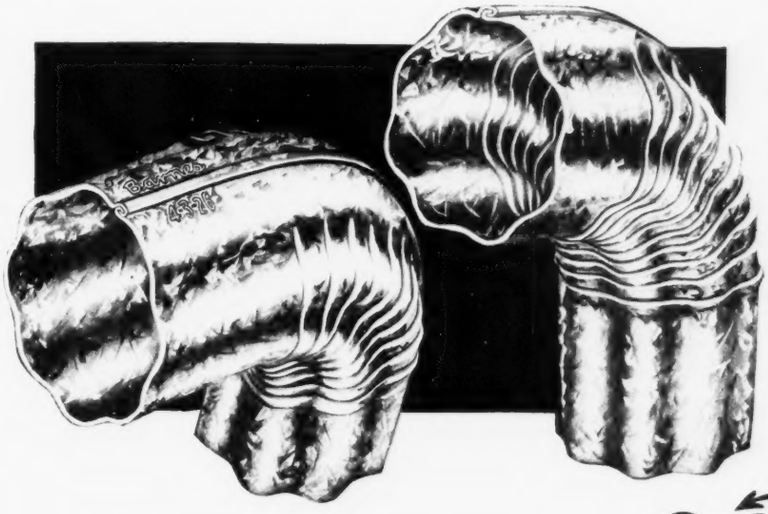
The "Barnes" Super Elbow

Stand on one and test its strength



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HEAVIER—STRONGER

...yet cost no more than the ordinary elbow

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Magnified View of Seam Lock

The Barnes Locked Seam cannot come apart

THE Barnes locked seam as used in Elbows and Conductor is an exclusive Barnes feature. Being on the outside curve of the Elbow, it insures greatest strength and rigidity.

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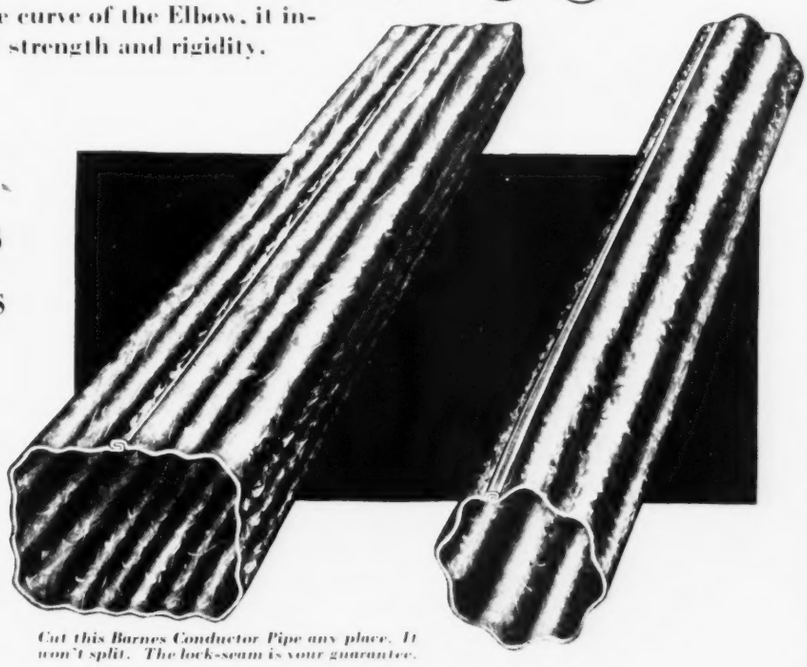
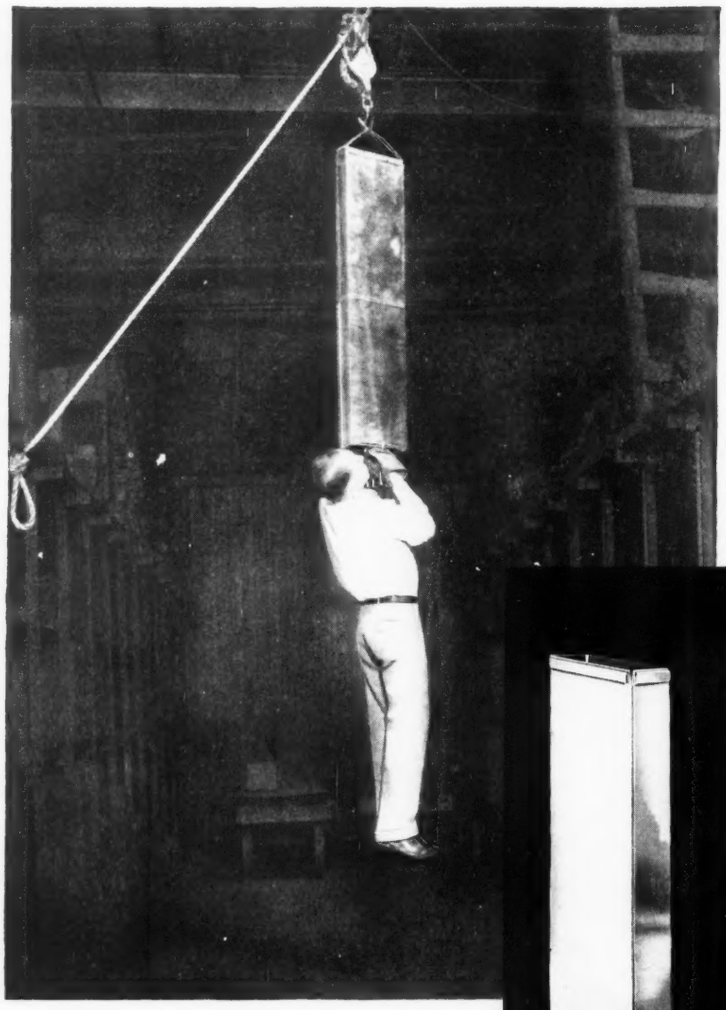


Cut this Barnes Conductor Pipe any place. It won't split. The lock-seam is your guarantee.

BARNES METAL PRODUCTS COMPANY

1425 W. 16th Street *Manufacturers of* Chicago, Illinois

Conductor Pipe, Elbows, Eaves Trough and Fittings. All Sizes. All Metals



So strong are the end locks on this Milcor pipe that the weight of a man fails to pull them apart.

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AGAIN, *Milcor* leads the way in new developments in sheet metal . . . this time with a new single Wall Pipe having the famous Self-lock joint and end joints that lock automatically in a most permanent way.

The new Single Tin Wall Pipe and Fittings require no tools for assembling and installing. Simply press the side seam and it locks. Turn over a lip on either end of the seam . . . and the seam is locked the long way of the pipe. The end locks are integral with the pipe. To assemble sections of wall pipe, press ends together until there is a slight click . . . and the sections are locked to stay.

The new Single Tin Fittings are available for first and second floors. Send now for catalog No. 30. See how this newest *Milcor* achievement saves time . . . does a better job at lower cost . . . and gives you an extra profit.

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Milwaukee, Wis. **Canton, Ohio**

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